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JULY 1993

MacUser

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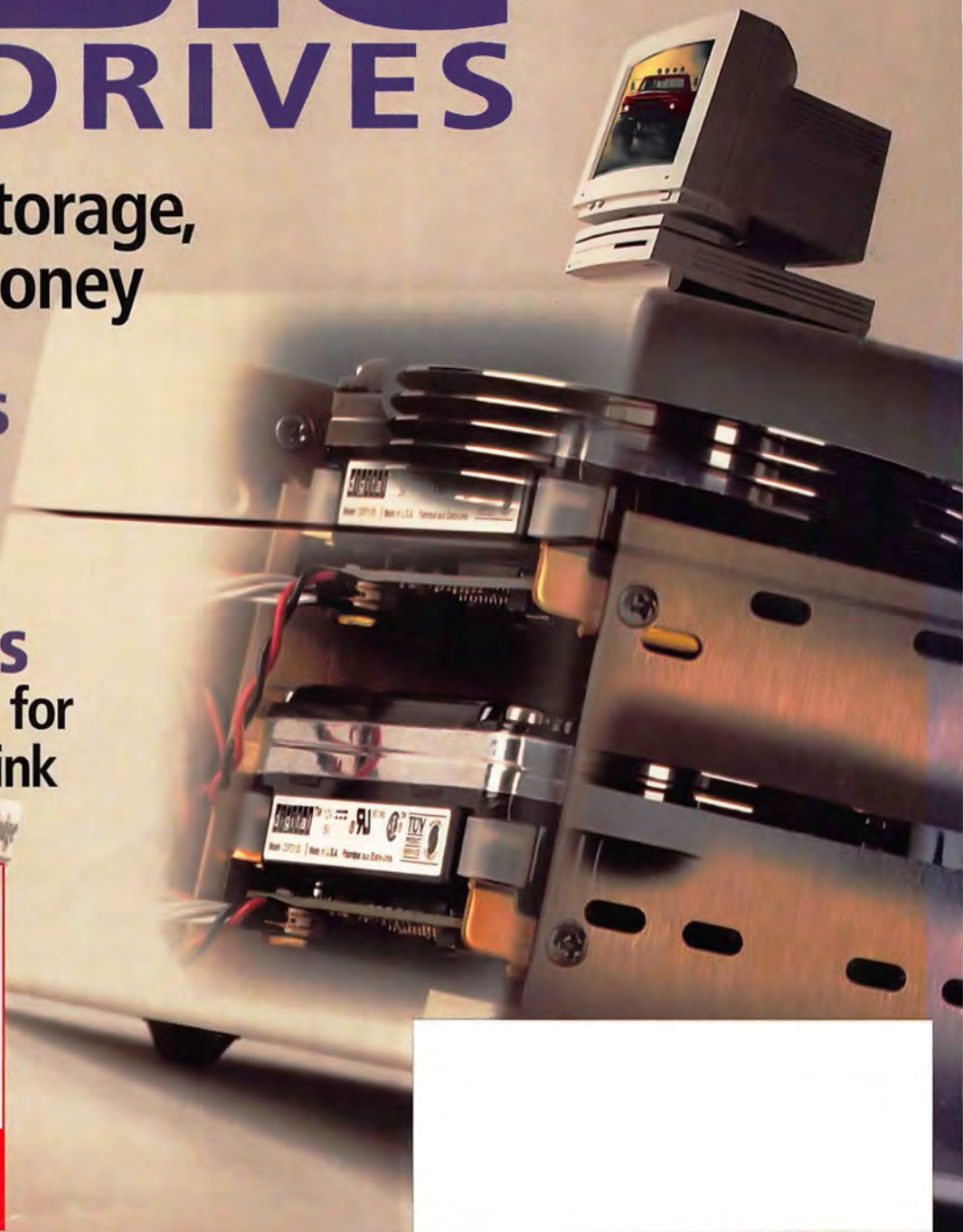
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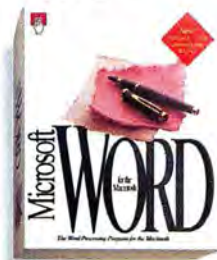


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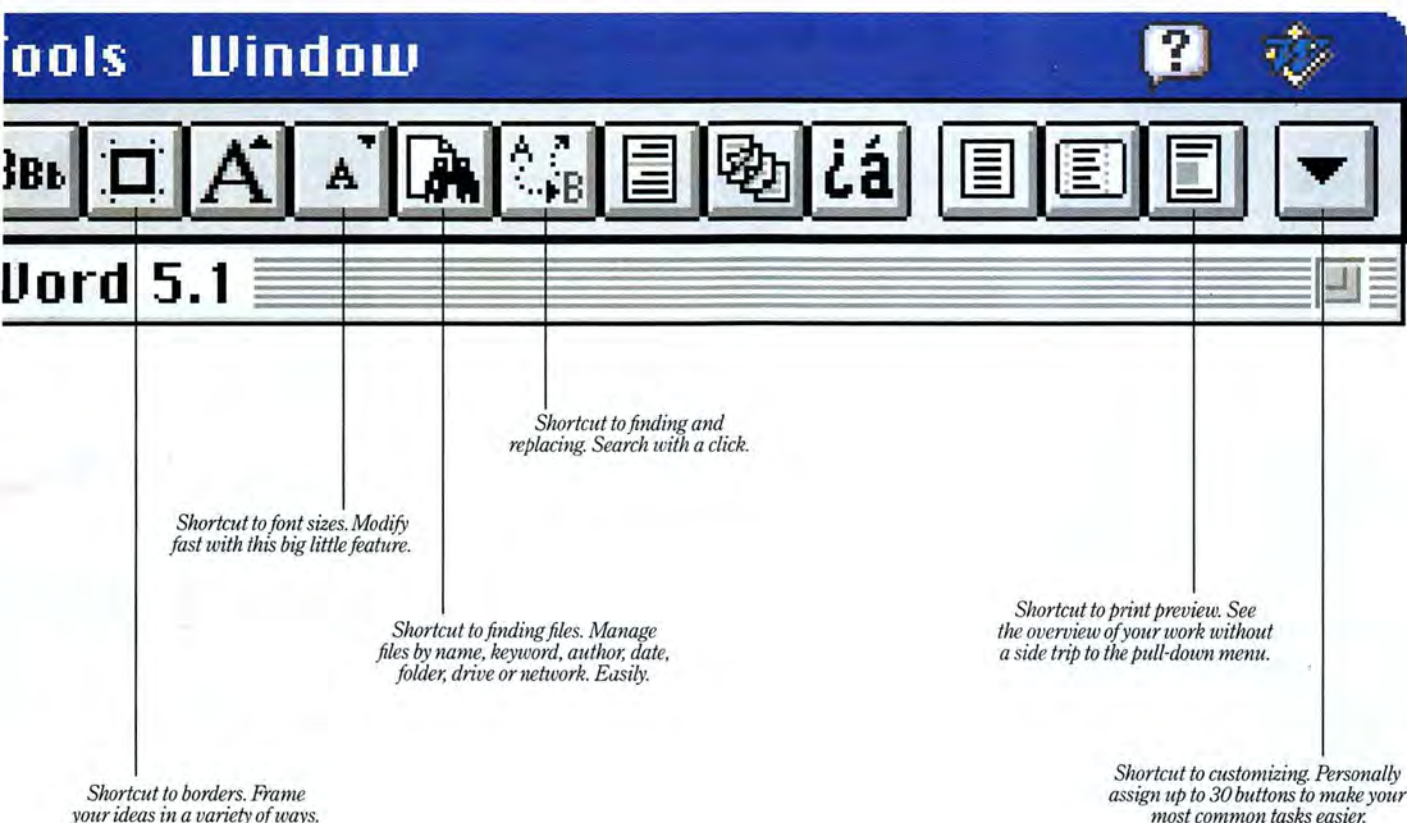
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Which presentation package makes the best impression?



130

The best monitor deals are in the monochrome world.



On the cover: The FWB SledgeHammer 2000FMF offers the lowest cost per megabyte of the four disk arrays we tested for our report on 1- and 2-gigabyte hard drives.

Cover photo by Fred Stimson
Inset photo and cutaway
by Peter Gould

MacUser

July 1993

Volume 9 Number 7

Cover Story

Heavyweight Hard Drives

By Mark Hill

MacUser LABS We tested 37 gigabyte drives, including 4 disk arrays, ranging in capacity from 800 to 2,500 megabytes and in price from \$1,449 to \$8,655 on the street. Our conclusion? If you need one, there's never been a better time to buy. **92**

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By Shelley Cryan

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By Owen W. Linzmayer

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By Eric Taub

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4 July 1993 **MacUser**

MacUser

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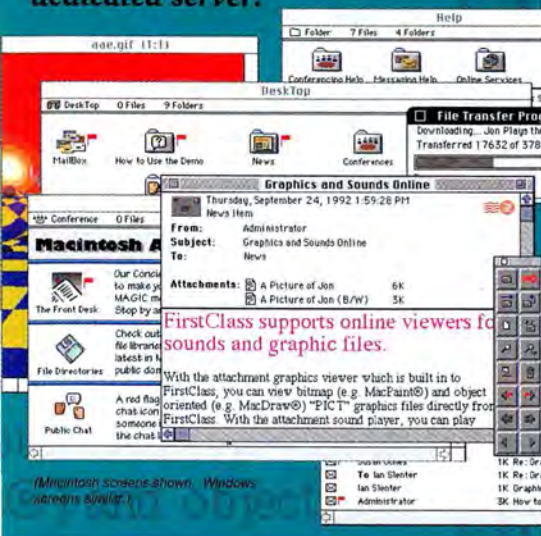
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About

MacUser

Keeping Pace

This is bound to be the most pirated piece of software since ATM." The speaker is *MacUser's* printer expert, Tony Bojorquez, and the software he so dubiously honors is Adobe Systems' freshly released PostScript Level 2 printer driver. (For those of you who prefer the *MacUser*-endorsed legal route, versions of the new driver will be available from both Adobe Systems and Apple Computer for less than \$30.)

Tony was the project leader for this month's sneak preview of the long-awaited product. After 62 grueling hours of testing, the results are in: PostScript printers can print twice as fast with the new driver. *Can* is the operative word here. For the complete PostScript Level 2 driver lowdown and the fruit of Tony's labors, see "Drive My Printer," page 167.

Doubling print speed is good news, but a two-year wait for a driver? What was Adobe thinking? Maybe it was distracted. The company also recently released an upgrade (version 2.5) to Photoshop (see page 56) and the ATM-supplanting Super-ATM (see page 62), which boasts a special font-substitution feature based on Adobe's nifty multiple-master technology. Or maybe Adobe was preoccupied with another eagerly awaited product: Acrobat, the cross-platform document viewer that, according to the company, will signal the advent of universal electronic publishing. Adobe says Acrobat will be available this year.

Tony, wiping the sweat from his brow, hopes this new cross-platform gymnast doesn't bring about the fabled paperless office and put him out of a job. Not to worry, Tony.

Meanwhile back on solid ground, this issue of *MacUser* is chock-full of news and reviews of real, existing products and developments, such as these:

The latest QuickTime release from Apple, featuring a faster frame rate and smoother motion; lower prices on CPU upgrades; and the first fruit of Apple's Personal Interactive Electronics Division: The PowerCD, a multifunction (audio-CD, CD-ROM, Photo CD) drive for less than \$500 (see page 51).

Cross-platform file-compatible presentation software (see page 122).

Monochrome and gray-scale monitors that perform and display better than their color counterparts (see page 130).

Also this month, we take a look at the state of the art in hard-disk drives. Among the 1- and 2-gigabyte drives we tested are four disk arrays, sometimes called RAID devices, which can give you twice the speed of a single hard drive (see page 92).

Now, says Tony, if we could just find a way to speed up the testing of the things.

— Nancy Groth



MacUser printer expert Tony Bojorquez examines Adobe's new PostScript Level 2 driver.

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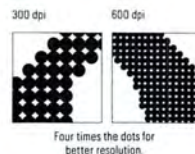
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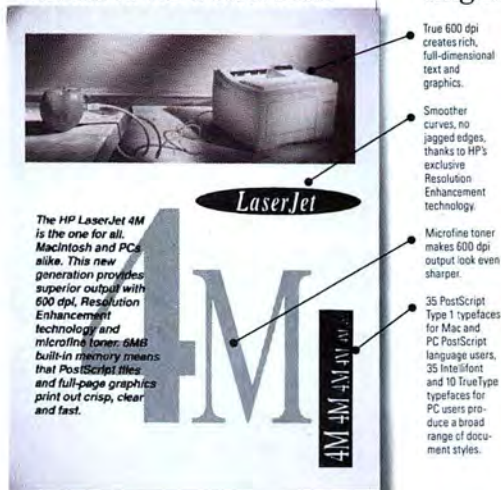
Greater flexibility. The HP LaserJet 4M printer also sets new standards in versatility, with a wide range of typefaces and two integrated paper trays. As well as the

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LETTERS

Not satisfied with April's "Buffoon Help" column (page 330), Dan Ginsberg and Walter Lee sent us more than 150 definitions to add to the glossary. What's a Performa? Someone on Broadway. How about StuffIt? That's a popular textbook for taxidermy courses. What's encryption? A funeral. And if you've been trying to figure out what UNISYS means, here's the answer: Having only one sister. Cha-ching! We have to wonder, though: Did you two compose these using Saloon Help?

Write to Letters to the Editor, c/o MacUser, 950

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Headed for X-tinction

The marketing geniuses at Apple Computer have done it again! The Mac IIvx, the multimedia wonder computer ("The Multimedia Mac: The Macintosh IIvx," December '92, page 126), has been abandoned and rendered obsolete only four months after its introduction. With the release of the Centris models ("Mainstream Marvels," April '93, page 106), the Mac IIvx, introduced in October 1992, is on the scrap heap in February 1993. Yes, I'm one of the suckers Apple duped into buying one of these instant relics. I should have realized when I saw the x in the name that I was in trouble. Look what happened to the Mac IIcx; the IIci came out before you could get your cx out of the box. I think the x designation means your computer will be "x-tinct" before you leave the store.

Sean Ogarrio
San Jose, CA

Learn from those of us who bought a Mac IIvx recently only to see the value drop

dramatically three months later when Apple introduced the Centris 610 and 650, the *real* midlevel computers: Don't ever buy an Apple product until six months after its introduction. Wait to see what marketing scheme Apple has in mind. On the other hand, you have to admire Apple — with the IIvx, it not only dumped a lot of prototypes it couldn't have otherwise sold but it also gets \$1,195 from its customers to upgrade to the Centris 650, so we end up paying at least \$800 more than we would have. What a brilliant strategy! If there ever comes a day when there is a viable alternative, the results couldn't happen to a nicer group of guys.

Joseph Compton
Encino, CA

As a recent buyer of a Mac IIvx, I was pleased to see Jon Zilber's fictional letter from Apple ("Letter Rip," April '93, page 25). Perhaps Apple will get the hint. The Centris line, no doubt two computers of excellent value, represents a slap in the face to everyone

who bought a IIvx, thinking it replaced the IIci. Now, I fully expect computers to age like small dogs, but Apple's introduction of the Centris computers was a marketing decision, not a technological advancement. As such, Apple has an obligation to offer inexpensive upgrades to the consumers who overpaid for the IIvx. With Apple's recent inconsistency, my next computer (gasp!) might just have Intel chips and run Windows. I'm sure I'm not the only IIvx buyer who feels that way.

Nicholas Kokonas
Chicago, IL

Apple is not the only party at fault in the IIvx rip-off; MacUser also shares in the blame for not reviewing, or even announcing, the Centris earlier than the April issue. How can this happen when, in the article "The Multimedia Mac: The Macintosh IIvx," author Russell Ito says, "Our tests were performed on extremely early models — not on production units. In fact, our tests were completed nearly four months prior to

Dear Mr. Sculley . . .

In March we asked, "If John Sculley should leave, who should take the helm of Apple, and why?" followed in April by "What should Apple do to keep its competitive edge over Microsoft and its Windows?" No one suggested killing two birds with one stone — Bill Gates takes over Apple, for instance — but the nomination of Guy Kawasaki to replace Sculley proves that old habits die hard. "Guy has the vision, the brains, the background, the energy, the wit, and the love of Macintosh that make him the perfect candidate," writes Ross T. Carter, of Frankfort, Kentucky. On the other end of the spectrum, Rick Schneblin, of Redlands, California, proposes conservative commentator Rush Limbaugh for several reasons, including his salesmanship. "Sales skyrocket of any product he casually mentions (CompuServe, Snapple, and Gurgling Cods). He is an incredible, practical thinker. Silent- or underdog-majority opinion is important to him (goodbye uppity who-cares-what-you-think Apple)." *Gurgling Cods?*

The debate about competitive strategies was a bit more contentious. "I disagree with your premise that Apple still has a competitive edge over Microsoft and Windows," writes John D. Harrington, of Oceanside, California. Rephrasing the question,

John says that to *regain* its competitive edge, "Apple must improve the price/performance ratio of its computer systems, make computers that are more expandable, and license its ROM chips to get more Macs into the market."

Gregory S. Balow, of Durand, Wisconsin, disagrees: "Do you really think Apple *needs* a competitive edge over Microsoft and Windows? I think Apple is way out in front of the competition."

Disagreeing with that, Cheryl Linker, of Chicago, asks: "Why should Apple be competitive? Why can't Apple work with other companies and share information and new developments? That way new software will come out at the same time as the machines come out with new systems."

From San Jose, California, Terence Curtis offers this suggestion: "Apple should do something unique to any electronic-product sales plan — design a computer in such a fashion that you would be able to continually upgrade and expand." You mean, like save the IIvx from obsolescence? "Otherwise," Terence concludes, "Apple should team up with Coke and Levi Strauss."

Finally, Scot Spencer, of Louisville, Kentucky, cuts to the chase: "Apple should come up with something new, period."

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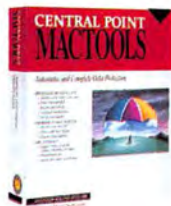
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actual shipping of the IIvx." Didn't you get any early Centris models to review? When consumers are about to spend thousands of dollars, information about new products should be timely. An early mention could have helped many who put money down on the IIvx. I could have canceled my order while waiting for the IIvx to ship and gotten a full refund.

How about becoming more of a consumer watchdog in your reviews than a slide-show barker pushing the latest and greatest? People depend on the information you publish to make well-informed choices. In the December issue, you call the IIvx a "desktop dynamo," but in April it is no more than a "lesser cousin" to the Centris. When you hype products, only to dump on them later, *MacUser* is treating consumers no better than Apple does.

Susanna F. Shoham

Brookline, MA

Unfortunately, we didn't have access to any Centris models when I was writing the IIvx story (heck, we barely had access to a working IIvx!). As for "hinting" about new products, well, there's a problem. Apple won't give us advance access to its products unless we promise not to print information on those products until after they've been announced. And without advance access, you'd be reading about a new product months after its introduction. Catch-22. — RI

Road Service

I found another great way to use my *MacUser* magazine. When our city received 9 inches of snow, my car was stuck in the parking lot. I tried rocking my car back and forth to get unstuck, but to no avail. I remembered the magazine in my back seat, tucked it under one rear tire, and successfully backed out!

Lorraine Doss

Louisville, KY

All Revved Up

"Supercharging Your Mac: 100 Accelerated Systems," by Shelly Brisbin (April '93, page 118), really points the way for owners of older Macs to go with the flow. Well done! I recently purchased and installed a 68030 accelerator from Mobius. Not only does the board and accompanying software do all that they're supposed to do but Mobius sales, tech support, and even the manual have also been outstanding.

Tim Garner

Fairfax, VA

In "Supercharging Your Mac," Shelly Brisbin states that low-cost cards from certain manufacturers, including DayStar, merely convert the LC to an LC II. The statement seems clear and definitive: In essence, these cards purport to do the same thing that the Apple LC II upgrade performs. But the graph appearing on page 125 seems to contradict the text. The Bottom Line pick shows an increase in speed of better than 100 percent for the DayStar product, which is certainly more than an LC II, whose speed is reflected in the graph on the last line. My befuddlement led me to call DayStar, whose personnel confirmed the relative accuracy of the test reported in the graph, not the text.

I also wonder why the author failed to mention the LC III upgrade available from Apple for \$599. It would seem to be extremely relevant for LC and LC II owners and would certainly be a viable option as far as speed, price, and even memory are concerned.

Larry D. Lewis

Atlanta, GA

I am in the process of buying an accelerator for my Mac IICI and was excited to see Shelly Brisbin's April article. However, I'm disappointed that your information wasn't more up-to-date. The entire DayStar Digital line had major price reductions advertised in your March issue. These changes render your Bottom Line picks useless for making purchasing decisions.

I understand that publishing such an article requires much prior planning, but I found no mention in a sidebar that things had changed since this review had taken place. I guess this is the silly nature of publishing, where a current magazine — that is, the April issue — is received in the first week in March and has reviews of products released in February but prereleased via nondisclosure agreements several weeks to months ahead of that.

Robert J. Boock

Deerwood, MD

As discussed in our lab report, three CPU upgrades replace the Macintosh LC's 68020 processor with a 16-megahertz 68030: the Equalizer LC (DayStar Digital), the Enterprise Intensifier (Total Systems), and the Extender (Extreme Systems). Because the main benefit of these products is not increased speed but, rather, access to virtual memory

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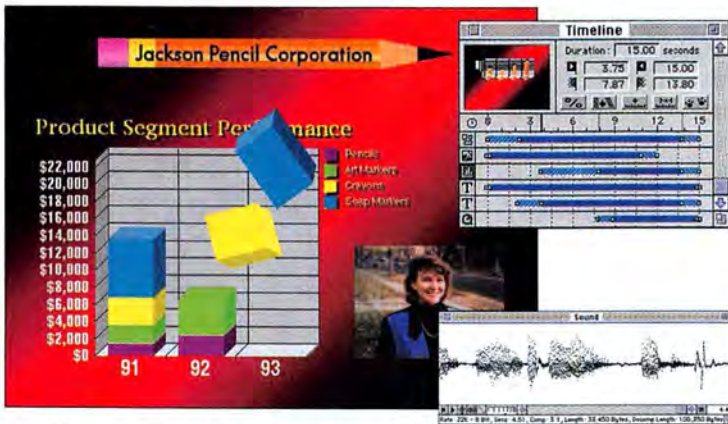
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and 32-bit addressing, we did not include them in our price/performance charts. Other DayStar, Total Systems, and Extreme Systems products that do accelerate the LC were included in the chart.

At the time we finished our lab report, Apple had not announced the LC III or an upgrade for LC and LC II owners. Obviously, the upgrade changes the price/performance equation for LC owners. Similarly, several price changes to 68030 accelerators, including DayStar's products, were announced after we went to press. These cuts reflect a substantial decrease in the price vendors now pay Motorola for the 68030 chip. However, you can still use the charts' performance component by comparing current prices with the raw-performance information provided. — SB

Buffoon Help Defined

I received my latest issue of *MacUser*; glanced at The Mac Workshop; and turned to the back, where I found "Buffoon Help" (April '93, page 330). Where was John Dvorak? I'm mad! I loved his column! He was sometimes misguided, true, but he was at least always funny. I looked at your explanation. Those people who object to Dvorak should not look at his column. At least let those of us who like him read it.

James Hunt
Austin, TX

Boo to the decision to drop Dvorak, especially if the motivation was nothing more than the taste, social value, and intelligibility of Dvorak's column. For many years, Dvorak has provided a cryptic but important viewpoint representing the millions of PC users who aren't gaga over the Mac and think Apple Computer has become a little "Big-Brotherish" since 1984. If you are going to dump Dvorak, please replace him with someone else who can help Mac enthusiasts fathom the unfathomable: how someone can have a Mac and a PC on a desk at the same time and still use the PC.

Eric H. Carter
Provo, Utah

Thank you for replacing Dvorak's column with something readable. Here's another definition to add to Buffoon Help: Dvorak: a keyboard layout or a buffoon columnist confined to *PC Magazine*.

David Thompson
Seattle, WA

Hooray, you finally got rid of Dvorak . . . Not! I wonder how many letters you got from people who fell for it (hmmm). It was hilarious, John. The dead giveaway was on page 6. Next year be more careful.

Paul Schreiber
Grade 9
Burlington, Ontario
Canada

Enter the Internet

"Out on the Internet" (April '93, page 209) should have mentioned the wealth of information about access providers on America Online and CompuServe. The best Internet access point for those who don't live in the few cities with a local dial-up provider is Delphi. In addition to being a full-service provider like AOL and CIS, Delphi offers full Internet access for as little as a dollar per hour through SprintNet. You can even have a free five-hour tryout (see the ad on page 308 of the April '93 issue).

Bill Kaup
Ithaca, NY

Share It Again, Sam

John Rizzo and Jeff Davis produced a good basic primer ("Passport to the Future: CD-ROM Drives," March '93, page 124) with just enough tech to carry the reader further. The article included a sidebar on network sharing of CD-ROMs but presents only two methods of sharing: file sharing and using AppleShare servers. There is another choice: Casa Blanca Works' DriveShare. DriveShare users are able to easily share many removable devices over a network without the limitations of file sharing or the AppleShare server maintenance.

John Catalano, President
Casa Blanca Works, Inc.
Greenbrae, CA

Surrealistic Illo

In James Bradbury's Personal Macintosh column (April '93, page 219), I noticed a slight error. In referring to the surrealist artist Magritte, Mr. Bradbury cites him as Henri. His name was actually René-François-Ghislain Magritte. A Belgian artist who lived between 1898 and 1967, he was greatly noted for his paradoxical and puzzling surrealist works and was the subject of a recent exhibition at the Metropolitan Museum of Art in New York City. In referring to Magritte as Henri, Mr. Bradbury may

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have confused him with another noted artist, Henri Matisse.

Zachary A. Cunha
Garden City, CA

And Matisse had a retrospective at the Museum of Modern Art in New York at approximately the same time. (See, Mac-User's got culture too.) Stay tuned: In the next issue, we'll confuse Manet with Monet. — JB

Call Waiting

In "The Electronic Magazine" (April '93, page 8), Nancy Groth states that there are 300,000 readers of the magazine who don't know about ZiffNet/Mac. Anyone who reads the magazine regularly would have to be pretty oblivious not to have learned about the electronic version. Let me suggest that the lower-than-hoped-for usage and awareness of ZiffNet/Mac are probably not due to readers' being unaware of the service but due to the lousy and expensive medium chosen to make it available. As Mac users, you folks should understand that statement. There is no way anyone in their right mind would sign on to CompuServe for the fun of it!

Bob Perdriau
Los Altos, CA

JD, Phone Home

I owe John Dvorak an apology. Until today I had never managed to read his column in its entirety. Somewhere along the way, the words on the page would just run together. I also have a short attention span. I won't go so far as to say that I thought his articles were dumb,

just that my funny bone wasn't tickled.

I have a houseguest now, and I read him the first two paragraphs from the March issue ("Weird Signs," page 340). His attention did not stray, so I continued my litany. After I'd completed the entire article, I commented on the truth of Dvorak's "events." My guest's eyes flew wide open. "You mean we were almost hit by a meteor?"

Mr. Dvorak, I concede to your superior intelligence and humorous good taste. Just don't come over.

Barbi Jo Campbell
Dorado, PR

Subliminal Messages

Is there really such a thing as a "dye-subliminal" printer (March '93, page 228), or as I suspect, did someone just put too much faith in the spelling checker? It sounds rather like the kind of thing you get when you have a bad AppleTalk connection and the devices flicker in and out of the Chooser so fast that you can never be quite certain if you really saw them or not.

Angus McIntyre
Brussels
Belgium

Dye-subliminal printers (dumb mistake) allow you to print pages (not our fault) through mind control (marketing error). Instead of spec'ing colors (we're smarter than that), you just think of the color you want (they mean to say), and it magically appears on the page (dye-sublimation printers). For more information, see "Picture Perfect: Continuous-Tone Printers," May '93, page 150. — PP

Corrections

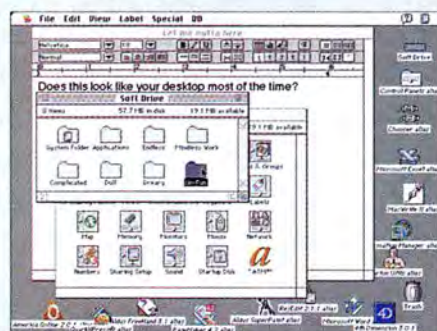
In "3.5 Magneto-Optical Drives" (April '93, page 162), a portion of the chart that appears on page 167 is incorrect. It should have appeared as follows:

Key	Drives from these manufacturers, using the system extension of the bundled formatting software						
	Drive manufacturer	OAI	Relax	Rodime	Saturne	Tass	NA
Mounted automatically							
Required SCSI Probe to mount							
Failed to mount							
Drive manufacturer/Formatting software							
Cartridges formatted by the drives from the manufacturers listed, using the bundled driver software	OAI/RD/Aria Formatter 2.02						
	Tass/Tass Commander 2.1.7						
	Third Wave/HDT Primer PE 1.1.2						
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To test the HP ScanJet IIC, we used the same set of tests we used for our most recent color-scanner lab report. The results showed **HP's new scanner to be the best in its class in both hardware and software.** The **ScanJet impresses from the moment you open the box.** Other

scanners use a removable screw that locks the scan head for shipping, but HP uses a locking lever that's built into the scanner itself. There's no screw to lose, and the lever is so easy to use that you'll find yourself locking the scan head more often, thereby increasing its life span.

anner category.

sed...



HP ScanJet IIC



HP ScanJet IIP

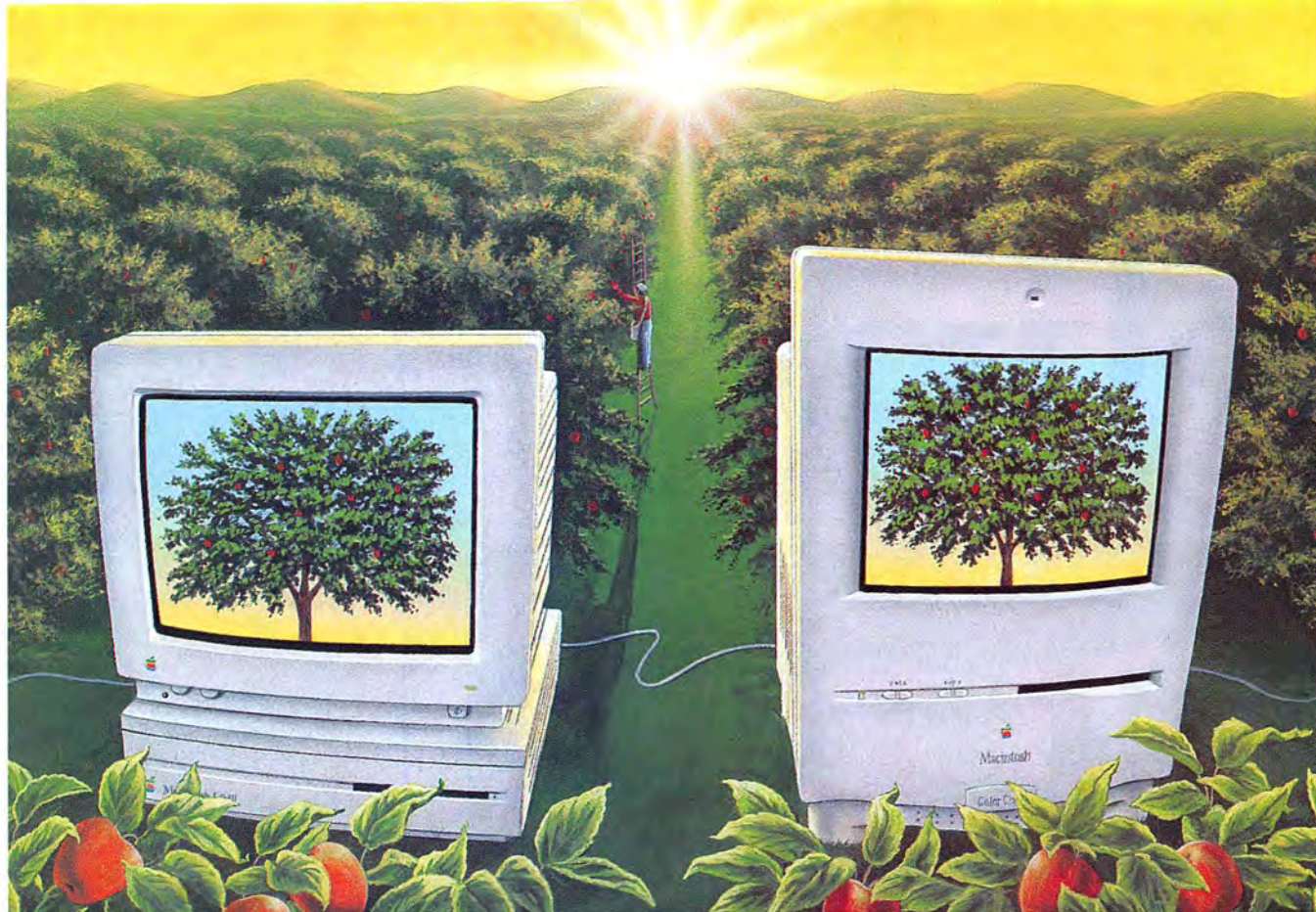
We'd hate to brag. So we'll let the Mac press do it for us.

Macworld awarded both the HP ScanJet IIC and IIP their *World Class Award*, and named the HP ScanJet IIC as the *Best Color Scanner* for 1992, and the HP ScanJet IIP as the *Best Black & White/Gray-Scale Scanner*. While *MacWeek* gave their prestigious *Diamond Award* to the HP ScanJet IIC.

Speed. Simplicity. And accuracy were all applauded. It's no wonder. HP's single-pass scanning delivers both lightning-fast speed and precise color registration. TWAIN support allows scanning without having to switch between applications. And HP AccuPage technology with 400-dpi resolution can tackle the toughest OCR challenges. What's more, capabilities this advanced have never been this affordable. List price on the HP ScanJet IIC is just \$1,599. The HP ScanJet IIP is just \$879. And right now, the HP ScanJet IIC includes Adobe[®] Photoshop LE.

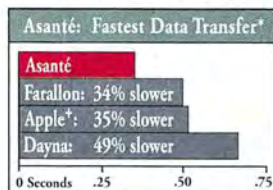
Impressed? Don't just take our word for it, or even the Mac press's. Attend one of our scanning seminars that will be held April through September, 1993. To find out more about the HP ScanJet IIC and IIP or seminars in your area, call 1-800-SCANJET, Ext. 7364.* And judge for yourself.

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Now that you have the new Apples, call the only company that can network the entire orchard.

Introducing new Ethernet solutions from the only complete Macintosh networking family. As Apple Computer releases more and more Macs,[®] only Asanté[™] is keeping pace with Ethernet[®] solutions for all of them.



*32K file transfer between a Quadra 950 and Quadra 700. Source: Recommended Test Labs, Inc. 1993. Call Asanté for complete report.

Introducing the MacCon+[™] LC III Ethernet adapter for the brand new Macintosh[®] LC III and Color Classic. It's a high-performance card that plugs into the LC III's 32-bit expansion slot for simple Thin and 10BaseT Ethernet connectivity. This adapter is also backward compatible with earlier models in the LC family, and the Performa 400.

Only Asanté has an Ethernet adapter for every Apple. The MacCon+ LC III is just the latest innovation from the only networking company with an Ethernet solution for every Apple CPU. Asanté's family tree includes the FriendlyNet[™] line of exter-

nal adapters that connect Macs with built-in Ethernet, such as the Centris 610, 650, and the Quadra 800, to Thick, Thin and 10BaseT networks. We also offer the new Mini EN/SC, the smallest and lightest SCSI-to-Ethernet adapter in the world. It's the perfect space-saving networking solution for any Macintosh without available expansion slots, and was specifically designed for portable use with the PowerBook line.

Apple CPU	Asanté Solution
PowerBook 165c	Mini EN/SC
Mac LC III	MacCon+ LC III
Centris 610 & 650 Quadra 800	FriendlyNet Media Adapters

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Mixed Messages



**Is there a
conspiracy
theorist in the
house?**

Shut the door. Pull the shades. Draw the blinds. Batten down the hatches. If you don't have any hatches, at least take your phone off the hook. And watch out for mysterious men in sunglasses playing with Scrabble tiles. The techno-conspirators are among us!

When the techno-espionage movie *Sneakers* came out, the techno-conspiracy theorists came out of the woodwork — at least judging from my recent mail.

Techno-conspiracy theorists differ from standard-issue conspiracy theorists only in the tools they use — and in the tools they're convinced "they" are using. Your normal garden-variety conspiracy theorist knows that President Clinton was elected because the letters in his name have the same numerological value as Millard Fillmore's. But a techno-conspiracy theorist believes that President Clinton was elected because his name has the same numerological value as the version of System 7 Tune-Up that was current on election day.

You can find proof that the Trilateral Commission secretly controls the world (through its agents the pope and the Queen of England) simply by examining the back of a \$1 bill, or so say the conspiracy seekers of yesteryear. Today's Trilateral techno-conspiracists seek their proof in Lotus 1-2-3's Balloon Help messages.

And all conspiracy theorists worth their salt know that the Apollo moon landings were all hoaxes: You can easily see this by playing the moon-walk videotapes backward. But it takes a QuickTime-wielding techno-conspiracy theorist to unravel the specifics, clearly proving that the whole space program is nothing more than a beta-test boondoggle for Adobe Premiere.

Yes, today's hard-core conspiracy theorist has a brand-new bag of tricks to help find meaning in the most trivial trivia.

Which leads, of course, to Microsoft.

If ever there were a subject ripe for conspiracy theorists, it's the astonishing control that Microsoft holds on the microcomputer marketplace.

The daily business press is full of reports of Microsoft conspiracy theories and counter-conspiracy alliances, the latest being:

- A reported plan whereby Apple and Novell will join forces to combat MS-DOS and Windows by merging aspects of the Mac OS with Novell's DR DOS.

- An alternative to Microsoft's OLE object-management standard (programmer-speak for making applications work better together), reportedly slated to be announced by Apple, IBM, and Novell any day now.

- An announcement from Borland and WordPerfect regarding plans for the two companies to cross-fertilize their sales and development efforts — coming just one or two steps short of merging with one another in response to competitive pressures from the Microsoft monolith.

But I didn't take the conspiracy theorists seriously until I got a floppy disk in the mail, in an unmarked envelope with no return address. No cover letter. No operating instructions. No ransom note. Not even a postmark.

On the disk was a neat little piece of shareware called Karma Manager. Karma Manager is a simple package (available on ZiffNet/Mac, by the way) written by Chuck Grissom that generates anagrams — words and phrases that are made by rearranging the letters of the original word or phrase.

I thought I'd just play around a little bit for some harmless fun at the expense of *MacUser's* columnists. Karma Manager revealed, for example, that you can rearrange the letters in Anti-Editor John C. Dvorak to produce *drank a jive orthodontic*.

Gibberish, right? Until I discovered that Andy Ihnatko transforms into *akin to handy*. Or that the anagrammatical mantra for Michael Swaine is *I slew a machine* or *hi, manic weasel* — take your pick. And Karma Manager revealed Michael's literary style by revealing that *each wan simile brought his malice anew*.

So far, it was all innocent fun, revealing nothing more profound than the richness of those 26 wacky letters we like to call the alphabet. That is, until I started feeding Karma Manager a few names of Mac products and companies. That's when things started getting spooky.

One Dull Machine

Karma Manager delivered a mixed verdict on the Macintosh Centris. It was blasé about the Centris' design (*schematic nonstir*) and downright critical of its reparability (*technician's storm*), but it revealed the Centris to be the ideal machine for presentation graphics (what with its ability to produce *omniscient charts*). Applauding its industrial design (especially its *chic ornaments*) and

the rarely addressed issue of a computer's aroma (*his romantic scent or mortician's stench* — take your pick), Karma Manager concluded that the Centris is underpriced (*instinct: more cash*).

The Macintosh LC, in contrast, is *no*

slim catch, although it represents *lost chic, man*. How about the long-awaited, much-hyped Apple Newton? Sorry: *We not pen pal*.

Obviously, Karma Manager has the potential to simplify the process of

reviewing products. Why bother with exhaustive lab-based benchmark tests when, with a few clicks and a keystroke or two, you can determine that the latest version of Novell NetWare is a *new, lean revolt*?

In fact, Karma Manager was practically jumping out of its screen to do *MacUser's* review of the new version of Aldus PageMaker: *Lame upgrade? Ask*. (It also had a special request for Aldus'

Not every comment from Karma Manager is particularly lucid — or even printable.

PR firm: Next time you send out promotional goodies — *please, a dark mug.*)

Karma Manager can also help cut the time-consuming tasks of writing and editing down to size. Groping for a column headline? Easy: *One dull machine*. Nothing like the *old luminance, eh?*

Of course, not every comment from Karma Manager is particularly lucid — or even printable. So what if Adobe Systems can *sedate my boss* — it's also the source of *mossy debates*. Is Apple Computer really nothing but a *perceptual mop*? And Karma Manager's opinion about Apple's advertising slogan "The Power to Be Your Best" is both baffling and unsuitable for a family magazine (I will say that it involves a *shrubbery*.)


Scoot, Firm

But it was only when I began exploring the hidden meanings pertaining to a certain software company in the Pacific Northwest that the power of these scrambled messages became clear. Sure, it's no surprise that they want you to believe that Microsoft is *comfort*. But Microsoft is no *stoic form* — it's secretly bragging about its control over pricing in the marketplace: *I form cost*.

And, frankly, who would be surprised to discover that Bill Gates is *least glib* (although some would say his *gall bites* when he *begs it all* — especially when it comes to matters of law, where his *legal bits* emerge).

But type in the words Microsoft Windows, and here's what comes out:

Wisdom — or swift con?

Uncanny, huh? The free world can only hope that John (*no such jelly*) Sculley has been brushing up on his Scrabble. 



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Of course, even Public Utilities can't prevent people from deleting files or reformatting their hard disks.

But it can bail them out of more difficult situations than any other utility software.

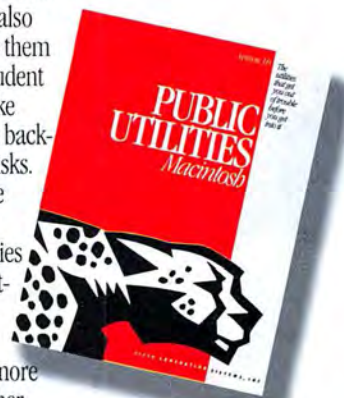
And unlike other programs, it won't *let* them get into difficult situations in the first place.

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The Buying Game



Hey, want to buy a used Mac? Here's how to kick the tires and get a great deal.

Last month, I covered what to do when faced with the thorny situation of having to convert your Mac into cold, hard cash. Last month I cared about and catered to you, the computer seller. But hey, if our elected officials can do a complete flip-flop once their palms slap Bible leather, I can too, and so this month I care only about you, the individual shopping for used equipment. Call me fickle.

Let's start with the most basic question of all: Where should you buy a used Mac? Buyers of used equipment have the same options that I discussed last month for sellers, but what's good for the seller ain't always so hot for the buyer. Take those locally published want-ad magazines, for instance. Last month I said they were great for you sellers out there, but this month I'm not so enthusiastic. See, the problem with them from the buyer's point of view is that the ads are placed by individuals who remember exactly what they paid for their Macs, down to the penny. Therefore, the "Computers" section tends to be jam-packed with ads like "Macintosh Plus: Orig. paid \$2,500, will sacrifice for \$2,000." Lightning does strike every now and then, though, so it's worth spending 10 or 15 minutes at the newsstand scanning the listings when the shopkeeper isn't looking.

Ads found at user-group meetings and on bulletin boards are actually a lot better for buyers than for sellers, because in both places there are lots of other users snooping in on the transaction. If someone were to leave a message advertising a \$2,000 Mac Plus on a public forum, chances are someone else would leave a rather to-the-point reply asking the sender what color the sky was on that person's home planet. Also, if potential sellers attend meetings or log on regularly, they're elevated in my eyes to friend-of-a-friend status, in that knowingly ripping you off would bring a whole wheelbarrowful of socially awkward situations. Friend-of-a-friend status isn't legally binding, of course, but it's a point in your favor.

What about used-Mac commercial dealers, such as Pre-Owned Electronics, of Waltham, Massachusetts (800-274-5343 or 617-275-4600), and Shreve Systems, of Shreveport, Louisiana (800-227-3971 or 318-424-9777)? Well, sorry to disappoint you, but both of these companies and other reputable outfits like them are actually excellent sources. They offer most of the safety and

convenience of buying new equipment; some even offer their own warranties. The only drawback of these dealers is that their prices are, by and large, reasonable.

Unreasonably Low Prices

As I hinted earlier, although it's possible to hit the jackpot every now and then and locate someone offering vengeance pricing on an ex-spouse's Mac — those kinds of bargains turn up only after a lot of patience and digging. You just have to keep haunting BBSs and newsstands as part of your regular routine until you hit pay dirt. But do add one more publication to your hunt group: the business section of a well-regarded nearby city newspaper. Almost annually, usually around Presidents' Day, you'll find small ads for the clearance sales of large computer stores. These are usually two-day blowouts in which they rent space in an obscure industrial park and pile in all the out-of-date, refurbished, or demo merchandise that has been accumulating since the last clearance sale. The merchandise is generally fairly current and in good shape, and usually the goal of the event is not so much to rake in the bucks as to get rid of the stuff. That they're renting office space just for the sale is a tip-off that they're getting desperate; if you offer 50 percent of the ticketed price, there's actually a good chance that the salesperson will merely shrug and reach for the receipt book.

But the key to finding dirt-cheap Macs lies in digging up the right kind of seller — specifically, one who couldn't care less whether a Mac sells for four thousand dollars or four cents. Pick up the phone, and call the main switchboards of any monolithic corporations or universities in your area. In the former case, ask for the phone number of its surplus-equipment office; in the latter, get the director of campus computing. Chances are, a series of such phone calls will put you in touch with some tired bureaucrats who occasionally are stuck with a mound of (relatively) old equipment that they're so desperate to get rid of that they may be open to a comically low bid. This is especially true for surplus-equipment offices of large companies; often these workers don't know a \$4,000 Mac IIci from a \$200 IBM PC clone and their chief goal is to clear the warehouse before that transfer shipment of old swivel chairs from the Framingham office arrives. A much simpler way to find such salvage



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offices is to post a message on a local BBS and ask.

Finally, a brief word on What Is a Fair Price. The rule of thumb I outlined last month will give you a pretty good estimate, but that shouldn't prevent you from checking the prices for an identical or similar Mac purchased new (yeah, yeah — but please, ridicule such basic advice and then heed it instead of crying in your beer because you only ridiculed it), asking others in user-group meetings and on-line services for their opinions on a given offer (this might even shake loose a better offer than the one you're contemplating), and picking up a copy of that previously abused want-ad magazine and checking the prices anyway. If nothing else, the magazine, with a few choice items circled in red, is a good prop to take with you when you examine a potential purchase, and it can be used to dicker the price down a bit.

Evaluating the Livestock

Buying used equipment is much simpler than selling it, chiefly because you don't have to worry so much about fraud. Really, you only have to ensure that you're getting what you're supposed to be getting, because in almost all used-Mac transactions, all sales are absolutely final.

OK. First, don't leave home without some sort of snooping software on an 800K disk. Don't trust the Finder to tell you about memory and drive configuration: A disreputable seller can goose 'em up with virtual memory and driver-based drive compression. At a minimum, bring a copy of MacEnvy (downloadable from any on-line service), which gives you a detailed catalog of the configuration and features of any Mac. Also, if you have access to a spiffier hardware-diagnostic utility, such as MicroMAT's MacEKG or Maxa's Snooper, run a full complement of tests.

Things to check for: Listen for odd noises from the hard drive; anything beyond a tolerable whine is abnormal. Examine the entire screen for dead pixels. Look at files' creation and modification dates; if a preponderance of them dates back to 1904, you could have dead PRAM on your hands and will wind up needing a new logic board.

Be sure to examine the case too. Tool

marks around the seams indicate that someone with the motor skills of Magilla Gorilla has probably been messing around inside. Also, check to see that the case's mottled surface is intact. A smooth surface indicates that it's been recently scrubbed with an abrasive, which isn't bad in itself but indicates that the machine may have been so badly mistreated that it needed a harsh cleaning to make it presentable.

Tool marks indicate that Magilla Gorilla has been messing around inside.

If it's at all possible, crack open the case and take a look inside. Look for any screws with stripped heads (another sign of indelicate hands operating therein), and closely examine the circuit board for any signs of manual soldering or installation of odd components. You want no part of a Mac whose motherboard was soldered back together by the aforementioned lout or one that has been modified in a way Apple wouldn't cotton to (such as a Hsi that has had a faster oscillator crystal installed to speed it up).

Finally, operate the machine for a good, solid hour to give any hardware problems the opportunity to bubble up to the surface, and then pop the lid again and take a whiff of the innards. After an initial break-in period, no 100-percent-healthy Mac should smell unpleasant when it's hot. No burning-plastic smell, no ozone, no problem.

Wrapping It Up

One final bit of unpleasantness: If you do decide to purchase that sucker, get a receipt that specifies the hardware and its exact configuration (a signed printout of a MacEnvy report will handle that), all serial numbers, the selling price, and the date and time of sale. If you're dealing with a company, this has probably already been taken care of, but if you're dealing with an average schmo, try to weasel a backdoor into the receipt at the end of the transaction. A phrase on the receipt along the lines of "if the hardware proves to be defective within 48 hours, the deal's off" — along with another one detailing how you're going to use the machine in that period of time — is a safety net almost any legitimate seller will grant you. If not, look out for those two magic words: *as is*. They mean that if the whole Mac goes kablooeey as soon as you get it into your car, well, that's life, kiddo. ☹

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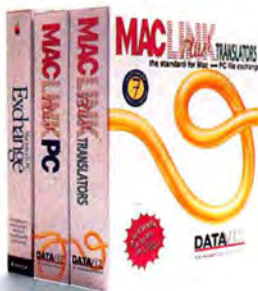


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Macintosh PC Exchange makes DOS disks appear on the Mac desktop and shows their contents as Macintosh files and folders. New Macintosh Easy Open is a System 7 extension that helps you open Mac or PC files when the application that created them isn't on your Mac. These technologies from Apple teamed with our translators offer the most complete solution to file transfer and translation available in a single package.

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So if you're thinking about getting other high-capacity drives, think twice. Because there's only one drive you really need to have.



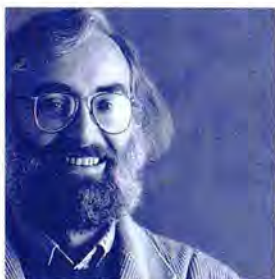
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let freedom ring.**

Apple's starting to act more and more like the former Soviet Union in its death throes.

Remember Mikhail Gorbachev's failed attempt to hold on to central control for the Party? Remember his fatally hesitant embrace of the free-enterprise system?

Enter Morris Taradalsky, charged with bringing enterprise computing to Apple.

What's enterprise computing? For Apple, it's all those big multiplatform sites that currently prefer, by a factor of 10, Microsoft's system software running on Intel's microprocessors. It's a new name for a market Apple has repeatedly failed to break in to.

Taradalsky's Enterprise Systems Division recently announced its first three products (see "Multiuser Macs," June '93, page 36). These dedicated servers are good machines, and the top-of-the-line Apple Workgroup Server 95 is competitive with anything else out there. With proper pricing, these products should please the Mac users who have been waiting for Apple to deliver a dedicated server for — how long? "Apple has been promising a file server for some time..." (*MacUser*, October '85). Right.

But at the risk of alienating readers, I must delicately inquire: What does pleasing current Mac users have to do with breaking in to new markets? After all, for Apple, that's what enterprise computing is all about. Wouldn't you think that an Enterprise Systems Division would be a little bit concerned about getting Macs into non-Mac sites?

Nyet, comrade. The ESD's servers are designed for what Taradalsky calls "Mac mostly" sites. It's a cute little term for a cute little market, but enterprise computing is not Mac-mostly. Thus these servers can't be part of a realistic enterprise-computing strategy.

But facts like that foul the party line. A realistic enterprise-computing strategy for Apple means playing on *its* court. Apple doesn't play well on other kids' courts. It likes to own the ball, the net, and the driveway. Like the Communist party in the former Soviet Union, Apple plays only when it gets to make the rules.

Although Apple has prospered behind its wall of proprietary technology, the big game is outside the wall. Yes, I know there are several people inside the wall who have heard of Microsoft and Intel. And Apple's VITAL conference in April showed that the company is listening to information-systems managers.

(VITAL is an acronym that Apple expects me to tell you — with a straight face — stands for Virtually Integrated Technical Architecture Lifecycle. It is a plan for the technical management of enterprisewide multiplatform information systems according to rules defined by — the Central Committee. I mean, Apple Computer.)

Then, too, there's nothing technically daunting about enterprise systems; Apple can do enterprise computing with one hand tied behind its back (which is, by an odd coincidence, exactly what the Intel architecture requires). Apple's difficulties vis-à-vis enterprise computing are all in its head, just a little problem of denial. I have no doubt that Apple will field some truly enterprising systems real soon. But real soon may be too late.

Apple is covering all the bases — and palms and laps and coffee tables and other horizontal surfaces — in its search for new markets, but to remain a player in the '90s, it needs to cover some more desktops. And unless Apple can break in to enterprise computing, it won't close the desktop gap.

It's the kind of situation for which nature invented the panic reaction. Bizarre scenarios are not to be discounted. Apple could drag out that Intel 486 implementation of System 7 it's been working on, drop it into a box with the MS-DOS clone it's been testing, and try to compete with MS-DOS and Windows on "their" hardware.

Would that be a good enterprise systems strategy? I seriously doubt it, although it would be an interesting experiment. The extent to which DOS/Windows dominance is really Intel-microprocessor dominance has never been convincingly put to the test. A 486 port would factor Intel out of the equation, showing what Microsoft is *really* worth.

But Apple has no time for experiments. Recently, two large enterprising customers defected from the Apple camp. What Apple needs to do — and do now — is to demonstrate to large-volume customers that Macs are a viable choice for more than the desktop-publishing, sales, and design departments. And to do that, it needs to embrace non-Apple standards such as SNMP (Simple Network Management Protocol), for network management.

Gorbachev held on to central control too long. Apple might still have a chance to be a player in the big game, if it would Just Do It.

Mr. Taradalsky, tear down that wall. ☐

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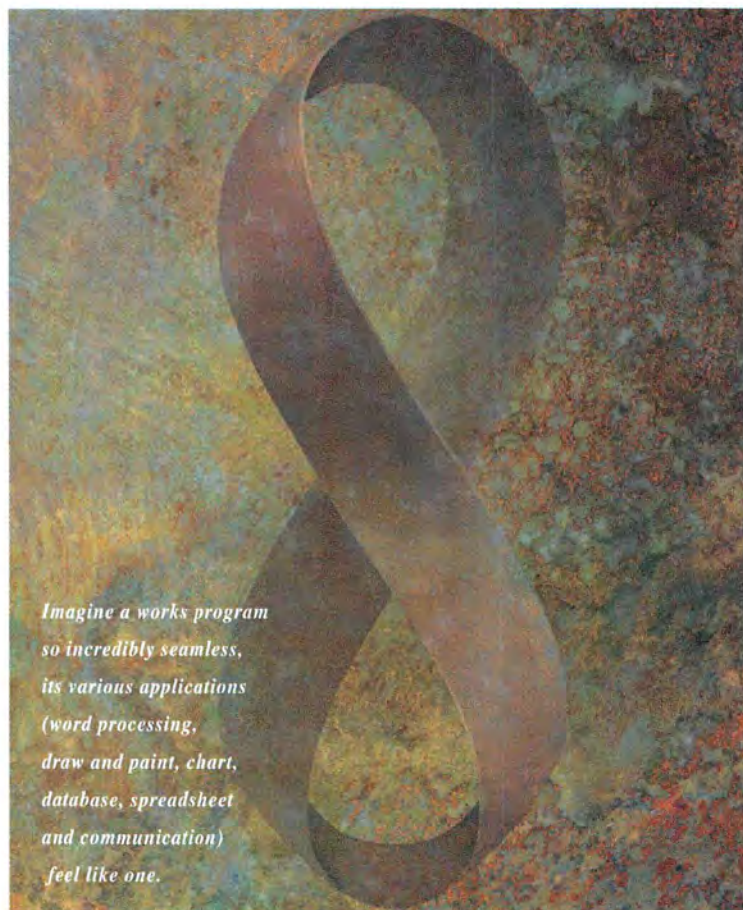
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In-Context Editing [™] (multiple documents)	YES	NO	NO	NO
Paint and Draw	256 custom	81 draw	256	NO
Common tool bar with module-specific tools	YES	NO	NO	NO
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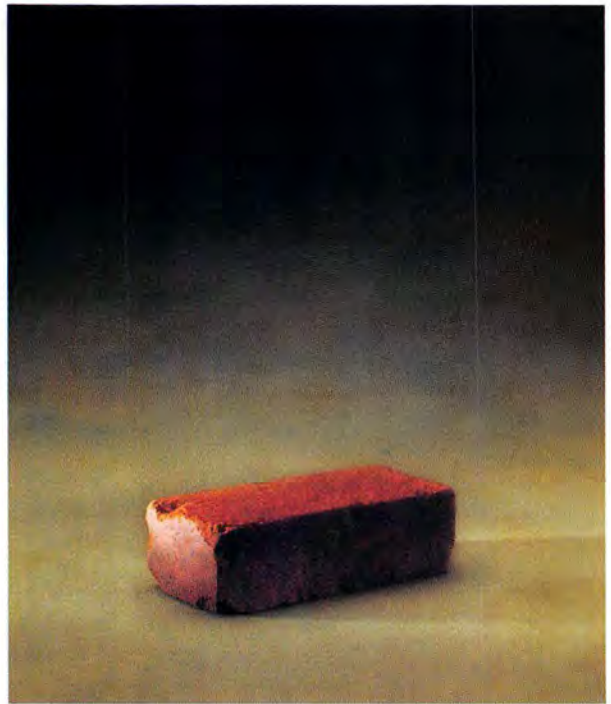
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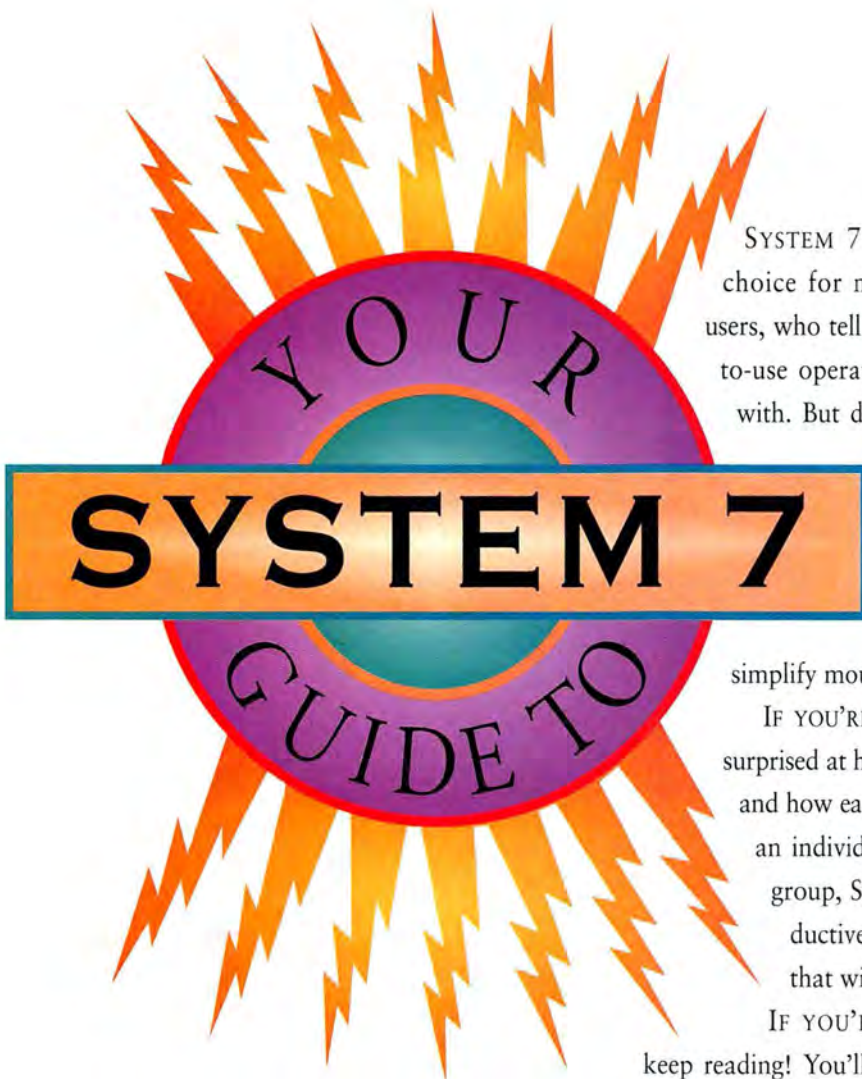
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SYSTEM 7 IS THE OPERATING SYSTEM OF choice for more than 6 million Macintosh users, who tell us it's the most powerful, easiest-to-use operating system they've ever worked with. But don't take their word for it. Read

through our collection of 30 tips and techniques and see for yourself how this award-winning system software from Apple Computer can

simplify mousework on your Mac.

IF YOU'RE A SYSTEM 6 USER, YOU MAY BE surprised at how much System 7 can do for you and how easy it is to upgrade. Whether you're an individual Mac user or part of a workgroup, System 7 will make you more productive. Look for the ✓ next to features that will be of particular interest to you.

IF YOU'RE ALREADY A SYSTEM 7 USER, keep reading! You'll learn what's new in version 7.1

and maybe even discover a few features and shortcuts.

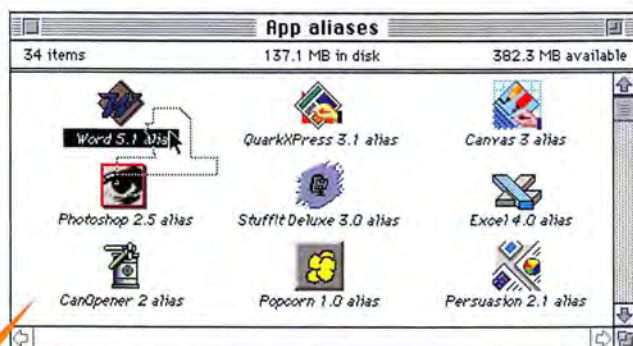
This is the second in a series of articles from Apple Computer designed to help you get the most out of System 7. In the May issue of *MacUser*, we focused on personal productivity. In this issue, we'll demonstrate how System 7 can help you work more effectively in groups and make life easier for network administrators.

**30 Ways
to Work
Faster and
Smarter
with Your
Macintosh**

Easier collaboration • Faster file access • No-fuss networking • Multitasking power • File sharing • Security options

1 Instant Access to Applications

One of the most powerful and versatile features of System 7 is the *alias*, a duplicate file icon that lets your files, folders, and disks appear to be in several places at once.



A great time-saver: Make aliases of your applications and put them in a folder on the desktop. Now you can open any program instantly by double-clicking or by dragging a document over the icon.

Because aliases are small (about 2K each), you can make several for frequently used files and distribute them in different places—on the desktop, in the Apple menu, or in different folders. Each alias serves as a pointer to the original file. Double-click an alias of Photoshop, for example, and System 7 will launch the original program, which may be stored, along with its support files, three levels deep in your Applications folder.

For an instant productivity boost, make aliases of all your applications and put them in a single folder on your desktop. Now you can immediately open any application without having to burrow through a series of folders. Just double-click its alias or drag a document over the alias's icon. If the program can open (or place) the file, the icon will be highlighted. When you release the mouse button, it opens the file.

This drag-and-drop file launching (another System 7 feature) is also an ideal way to find a program that can open a file which displays the "Application can't be found" alert when you double-click it.

To quickly create a folder of aliased applications, select the System 7 Find command (File menu) and click the More Choices button.

In the resulting dialog box, change the pop-up menus to read "kind contains application" and click the checkbox labeled "all at once." Click the Find button and System 7 will locate and select all of your applications simultaneously.

With the applications selected, choose Make Alias (File menu) to create aliases for every program. The aliases are now selected; drag them to a new folder on your hard disk, and you're ready for action.

2 Organizing Your Desktop

System 7 has a more robust Clean Up command that makes it easier to organize your icons. At the desktop level, for example, holding down the Option key and selecting Clean Up All from the Special menu will arrange all icons on the desktop in a neat column at the upper right corner of the screen.

You can combine the Clean Up command with View menu options to simultaneously straighten up a window and organize files in the order you prefer—by name, size, kind, label, or date. For example, choose By Name from the View menu. Then switch to an icon view, hold down the Option key, and

select Clean Up by Name. To sort only a few icons, select them, hold down the Shift key, and choose Clean Up Selection.

3 Working While You Copy Files

Because System 7 supports multitasking, you can work in an application while System 7 copies files in the background—a great strategy if you're archiving files to a backup disk.

The application must be open before you begin copying files. You then choose it from the Applications menu or click in one of its windows to activate it and continue working.

System 7 can also handle other time-consuming chores in the background, including printing, faxing, and downloading files from on-line services.

4 Opening the System File

Under System 7, you can open the System file by double-clicking its icon. The System file will open into a window, as if it were a folder, and display its contents as individual file icons.

You can install or remove items by dragging them in and out of the window—a much simpler system than the Font/DA Mover of System 6.

Under System 6, both fonts and desk accessories were installed in the System file. In System 7.1, however, the System file stores only sounds and keyboard resources. Fonts now reside in their own folder, and desk accessories are stand-alone applications.

Fast Fact: You can hear a sound (*Quack!*) by double-clicking its icon.



5 Instant Access to Network Volumes

If you frequently access an AppleShare server or shared folder over the network, you can bypass the Chooser's multistep connection procedures by making an alias of the AppleShare volume while it's mounted on your desktop.

Once you've done this, simply double-click the alias whenever you want to use the server or shared folder. System 7 will automatically connect you, prompt you for the password (if required), and place the volume on your desktop—all without using the Chooser.

You can keep the alias any-

where you like. Put it in the Apple Menu Items folder, for example, and you can open the server or shared folder directly from the Apple menu.

7 Mouseless Maneuvers

Did you know you can use the numeric keypad rather than the mouse to control the cursor? A little-known feature of the Easy Access control panel, Mouse Keys is handy for precise movements—perhaps to fine-tune a graphic by nudging it a pixel at a time—or if



you're simply more comfortable using a keyboard than a mouse.

To turn on Mouse Keys, make sure Easy Access is installed, then press Command-Shift-Clear. The 5 on the numeric keypad will now work like the mouse button; press it once to click and twice to double-click. Use the eight keys surrounding the 5 to move the cursor (for example, the 4 and 6 keys will move it to the left and right). To mimic a click-and-drag sequence, tap the 0 key twice to lock down the mouse button and then press a directional key. Press the decimal-point key twice to release the mouse button.

Fast Fact: If your "real" mouse freezes up, you can use Mouse Keys to save your work, quit the program, and restart the Mac.

6 Drop Boxes

System 7 file sharing is a tremendous productivity booster for workgroups. By sharing a folder on your hard disk, you allow other network users to drop off or pick up files at their convenience. Their level of access—that is, whether they can make changes to files or even view them—is determined by the access privileges you assign to the folder.

You can create a folder that's accessible by everyone on the network, allowing them to add, delete, move, rename, and copy files—just as if the folder were on their own hard disks. Just select the folder and choose the Sharing command (File menu). In the Sharing dialog box, click the checkboxes labeled "Share this item and its contents" and "Can't be moved, renamed, or deleted," which prevents users from altering the folder. Also check all of the boxes to the right of Everyone.

Everyone on the network can now use this folder, assuming you've turned on guest access for your Mac. To do so, open the Users & Groups control panel and double-click the Guest icon. In the resulting dialog box, click the checkbox labeled "Allow guests to connect."

Perhaps you'd prefer the privacy of a Drop Box, a folder that lets users add files but prevents them from viewing or removing the contents. To make a Drop Box, uncheck the "See Files" and "See Folders" boxes for User/Group and Everyone in the folder's Sharing dialog box. (Be sure to leave "Make Changes" checked.)

An Out Box, on the other hand, lets users see and copy files but doesn't allow them to add or change files. To define an Out Box, check all of the privileges *except* "Make Changes."

Kathy's In Box

Where: Tofu Hut:

☒ Share this item and its contents

	See Folders	See Files	Make Changes
Owner: Kathy Marty	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
User/Group: Creative Ser...	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Everyone	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

☐ Make all currently enclosed folders like this one

☒ Can't be moved, renamed or deleted

When you select a folder to share over your network, the Sharing dialog box lets you specify who can use it and their level of access.

8 Customizing Dates and Numbers

System 7.1 has two new control panels that let you change the way dates, times, and numbers appear in the Finder and in many applications. The Date & Time control panel lets you alter the date and time (surprise) as well as the formats for these items.



For example, you could opt to show the day of the week in dates, leave off the 19 in 1993, or use a 24-hour clock. The Alarm Clock and General Control panels will reflect these changes, as will applications (such as Microsoft Word) that let you automatically insert the date and time.

The Numbers control panel lets you customize the display of numbers and currency, which comes in handy if you work with people in countries where numbers in the thousands are separated by periods rather than commas. Again, your changes will appear in programs, such as spreadsheets, that let you automatically format numbers.

9 A Smarter Desktop

System 7 provides many improvements to Finder windows that make navigating the desktop *much* easier. Here are three you're sure to appreciate:

Holding down the mouse button and dragging to the edge of a window makes the window automatically scroll. This comes in handy when you're dragging files to a folder that isn't currently visible or drawing a large selection marquee.

Clicking the zoom box now opens a window just wide enough

for you to see all of its contents, instead of filling the entire screen—a major improvement if you have a 21-inch monitor!

Moving and copying files between windows is much easier, because clicking a file icon in a background window doesn't activate that window unless you release the mouse button while the cursor is still in the window. This is a major improvement over System 6, where a background window jumped to the

front as soon as you clicked in it, often obscuring the destination window or icon.

Fast Fact: If you select some files and then realize that you need to scroll another window to bring the destination folder into view, you can switch to the background window without deselecting the files in the active window. Just hold down the Command key when you click in the background window and the files will remain highlighted.

System 7 vs. Windows: You Decide



System 7 provides powerful features that help you work quickly and efficiently, whether on your own or in a workgroup. For example, the Macintosh is the only family of personal computers that provides built-in networking and file-sharing features as standard equipment.

How do the networking capabilities of System 7 stack up against those of Windows 3.1? See for yourself.

Joining a Network

Right out of the box, the Mac is ready to be networked—it comes with a physical connection (LocalTalk) and a communications protocol (AppleTalk). Higher-end Macs, such as the Macintosh Quadra 950, even have Ethernet connections.

Networking your Mac couldn't be simpler: Plug a network cable into the printer port, then open the Chooser and click the radio button that turns on AppleTalk. That's it. The Mac can now talk to any device on the network, from the local printer and your coworkers' computers to file servers and mainframes.

A PC running Windows doesn't have built-in networking capabilities. To add it to a network, you must first open the computer case and install a network interface card, making sure to properly configure any jumpers or dip switches. You then install the appropriate driver software and configure the network parameters. Next, you run Windows Setup to load the driver for the installed network software. Finally, you reboot the computer. If you're a network administrator, you must perform these same steps for every PC added to the network.

Sharing Files

System 7 offers built-in file-sharing capabilities. This means you can make files on your Mac available to other users on a network without using any special software, interface cards, or a dedicated file server. To turn on file sharing, you simply click the Start button in the Sharing Setup control panel, then decide which folders you want to share and who will have access to them. Other users can access your shared folders by selecting them in the Chooser.

✓ = System 6 users, take note

10 Updating Files Automatically

Do you handle projects that require data from other people or departments? If so, the publish and subscribe capabilities of System 7 can make it easier to gather information and keep it up to date.

Perhaps you're working on a presentation in DeltaGraph Profes-

sional 2.0. To complete it, you need a logo from the art department, sales projections from the sales team, and a text summary from marketing. And, of course, everyone is revising their contribution up to the moment the presentation is due.

No problem. You can create live links between your presentation and your colleagues' data via publish and subscribe. For example, the sales team can chart its data in Lotus 1-2-3 and use the program's

Create Publisher command to make the chart available to other applications on the network via a special file called an *edition*. Within DeltaGraph Professional, you use the Subscribe To command to select this edition file and place a copy of the chart in your document.

A similar process allows you to incorporate the current logo design from the art department, which uses Photoshop, and the most recent prose from marketing, which uses MacWrite Pro.

As each department updates its work, the revisions are sent automatically over the network and reflected in your DeltaGraph Professional presentation, ensuring that your presentation is always accurate and up to date.

Fast Fact: Like all files, edition files must be placed on a server or in a shared folder in order to be accessed by other users on the network.

MYTH
System 7 is hard to install.

FACT
You can install it with one click of the mouse. In a matter of minutes, the Installer will automatically upgrade your Mac to System 7.

With Windows 3.1, it's not that easy. Assuming you've already installed network interface cards, you still must buy, install, and configure file-sharing software for every computer. If you purchase Microsoft Windows for Workgroups, for example, you have to provide such information as the type of network card in the PC, printer type, and the printer's port connection in order to set up the software. To avoid conflicts with other cards installed in your PC, you also need to provide the IRQ, base I/O port, and base memory address for the network card. Finally, you tell Windows for Workgroups which directory (folder) you want to share with other users. And remember, this sequence must be repeated for each PC on the network.

Keeping Track of Applications

On the Mac, you don't have to keep track of documents and applications because the system knows the location of every file, even over a network. Say, for example, your workgroup shares a file server and someone moves the Excel application or re-names its folder. No problem—your Mac will still find and launch Excel whenever you double-click a spreadsheet file.

This scenario is a problem for Windows users, however. Suppose a directory on the PC file server contains Excel and your spreadsheet, and you've created an icon in Program Manager (by dragging the file from File Manager into Program Manager) to represent your spreadsheet file. Normally, when you double-click this icon, Windows launches Excel and opens the spreadsheet. But if someone moves Excel or renames its directory, the icon will no longer be able to find the program because its pathname has changed, and you won't be able to access the spreadsheet.

To restore the connection, you must determine Excel's new pathname and update the icon's Command Line and Working Directory. Double-clicking the icon still won't open the spreadsheet, however, unless you also use the Associate command to tell the File Manager the new pathname. Furthermore, you're not the only one with a problem. Every user on the network will have to perform these same steps to relink their spreadsheet files with Excel.



11 Working with Others

If you write memos, reports, or presentations that others must review, you'll appreciate the file-sharing capabilities built into System 7. File sharing lets you make selected folders on your hard disk available to other users on your network, providing an easy way to exchange files and collaborate with coworkers.

Say, for example, you have created a report in Microsoft Word 5.1 that requires feedback from four colleagues. Your schedules don't permit face-to-face discussion, so you place



PowerBook users take note: At Ease uses 200K less RAM than the Finder, and its one-click buttons make it easy to locate and launch applications.



the file in a shared folder where each person can review it as time allows. The reviewers can use Word 5.1's text and voice annotations (a System 7-specific feature) to insert their comments without altering the original text. After everyone has read the report, you'll have a single marked-up document that contains all four readers' feedback.



appear on the desktop, and one mouse click opens any item. This instant access can be invaluable when you're in an important meeting or on the road—no more hunting through files and folders to get to the applications and documents you need.

The oversized one-click buttons also make easier targets if you're trying to open files while riding in a car or squeezed into the middle seat on a transcontinental flight—or if you haven't quite mastered the PowerBook trackball.

12 Saving PowerBook Memory

At Ease makes it easier and safer to share the contents of your Mac with kids, coworkers, and novice mousers. But At Ease holds a special attraction for owners of the PowerBook and other memory-constrained Mac models: It uses 200K less RAM than the Finder, freeing more memory for your applications.



When you run At Ease, the desktop consists of two screens of icons, one for applications and one for documents. You decide which programs and documents should

13 Organizing Your Apple Menu

System 7 lets you place just about anything on the Apple menu—applications, desk accessories, documents, folders, hard disks, even AppleShare volumes.

This can lead to some pretty long lists. Fortunately, it's easy to reorder the menu's contents to suit your work habits. The trick is to begin the filenames with a special character such as a space, period, hyphen, or bullet. To move frequently accessed items to the top of

the Apple menu, begin their filenames with one or more spaces. The more spaces that precede the name, the higher the item appears. Likewise, Option characters such as the diamond (Shift-Option-V) will sort items to the bottom of the list.

If you're a power user, try using dividers to separate menu sections—say, between applications, documents, and desk accessories. Create an alias of an empty folder and change the filename to one or more spaces followed by a string of hyphens. You can even make the folder's icon invisible by copying a white swatch in a paint program and pasting it over the icon in its Get Info window.

Fast Fact: Whenever possible, put aliases in the Apple Menu Items folder so you can keep the original files in more convenient folders along with their related files.

About This Macintosh...

- .TouchBASE Pro
- Compact Pro 1.32
- Excel 4.0 alias
- Quicken 3.0
-
- .To Do list
- Fax Cover
- Work folder alias
- HR Server alias
-
- Calculator
- Chooser
- Control Panels
- Monitors
- Scrapbook
- Pippin drive

14 File Sharing Shortcuts

QuicKeys 2.1.3, the popular macro utility from CE Software, includes a set of predefined shortcuts, called System 7 Specials, that give you faster, more precise control over file sharing, balloon help, and application switching.

Start FileSharing and Stop FileSharing, for example, let you turn file sharing on and off with a single keystroke rather than going through the Sharing Setup control panel. This is especially useful if you regularly switch file sharing on and off—for example, turning it on only when someone needs to get a file, then off



again once they've obtained it.

Or perhaps you want to leave file sharing off entirely during the day, but turn it on at night so you can retrieve files when you call in using AppleTalk Remote Access.

Just use the QuicKeys Timer Options to set the shortcuts to run automatically, turning file sharing on at 5 p.m. and off at 8 a.m.

16 Easy Installations

System 7 is intelligent about where items go in the System Folder, which can save you a lot of mousework. To install fonts, extensions, or control panels, just drag the files onto the System Folder icon. The Finder will list the locations it wants to place

the files and ask for your approval. Click OK and it will automatically install the files in the correct locations and report back on the results.

17 Refining Your File Searches

The System 7 Find command can locate files based on a variety of criteria, including size, kind, label, creation or modification date, and comments. You can combine these criteria to refine your searches and quickly locate just the file(s) you need.

Say, for example, you want to perform a simple backup of all documents that have been modified since May 11. First, select the Find command (Command-F) and click the

15 Map Magic

You may think the Map control panel presents a rather prosaic way to determine the local time for any point on the globe, but have you tried these tricks?

If you have a color monitor, get rid of that boring black-and-white map. Open the Scrapbook desk accessory and copy the color map it contains. Then open the Map and choose Paste. Cool, huh?

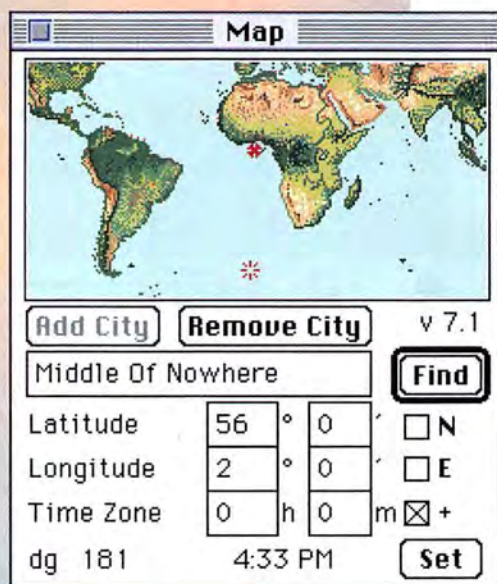


You can scroll around the world by clicking in the Map and dragging outside its boundaries.

Try typing *mid* as a location and clicking the Find button. You can globe-trot alphabetically through the Map's stored cities by repeatedly Option-clicking Find. (The next stop after Middle Of Nowhere is Minneapolis.) To add a city to the Map, type its name, click on its location, and click the Add City button.

The Map's mileage display normally shows the distance between the last location you clicked and your current one. If you'd prefer to always see the distance between your hometown and other points, click on your town, then click the Set button.

Similarly, "Time Zone" shows the time difference between your current location and Greenwich mean time. If you'd rather see the time difference between your previous and current locations, click the words "Time Zone" to switch the display to "Time Differ."



The Map control panel has a few tricks sure to please even armchair travelers. Try opening it with the Option and/or Shift keys held down.

MYTH
Networking my Mac
requires extra
hardware and software.

FACT
The Mac has built-in
networking capabilities,
with no hidden costs,
and System 7 adds
file-sharing features.

More Choices button. Change the pop-up menus to read "kind contains document" and click the checkbox labeled "all at once." Click the Find button, and System 7 will locate and select

all documents on
your hard disk.

With the documents selected, return to the More Choices dialog box and change the pop-up menus to read "date modified is after 5/11/93." Next, change the Search pop-up menu to "the selected items." Then do another Find. System 7 will search only within the

previously found files and eliminate those that don't meet the new criteria. Now all you have to do is copy the selected files to a backup disk.

19 Finding Files on Floppies—Fast

Aliases provide a clever way to quickly locate files on removable media such as floppy disks, CD-ROM discs, or SyQuest cartridges. Just make aliases of the files on the disks (cartridges, discs) and store them in a folder on your hard disk. When you need a file stored on a floppy, double-click the appropriate alias. System 7 will ask for the disk—by name (for example, Liam

Company Project)—that contains the original file. No longer do you have to root through piles of disks, trying to remember which one contains the file you need.

This strategy also works well if you use a file-compression utility, such as Compact Pro, to compress older files and then archive them to floppy disks. First copy the files onto the backup disk. Give each disk a unique name, such as Archive12. Then make aliases of the files on the floppies and copy the aliases back to your hard disk. Label the disks and store them in a safe place. You can now free up space on your hard disk by deleting the original files.

20 Playing Mac Movies on PCs

QuickTime is now available for PCs running Windows as well as for the Mac. With a couple of minor adjustments, you can play the same movies on both platforms.

To make a movie playable on a PC, open it on the Mac with the Movie Converter utility (part of the QuickTime Starter Kit) and choose



Save As (File menu). In the resulting dialog box, click the radio button labeled "Make movie self-contained" to instruct the utility to sever any links to other movies after incorporating the relevant video into the current movie. Also click the checkbox labeled "Playable on non-Apple computers" to save the movie in a PC-compatible file format.

Once you've saved the movie, it will be playable on PCs without further translation or file conversion. Before transferring the movie to a PC, remember to assign it a filename of no more than eight characters, plus the extension .MOV—for example, MYMOVIE.MOV.

18 An Improved Chooser

Under System 7, the Chooser desk accessory has a bigger window that can display more devices and zones, a real boon if you're part of a large network. You can use the Tab key to move between list boxes, and you can select a device (such as a printer,

zone, or AppleShare volume) via the arrow keys or by typing the first few characters of the device's name.

You also use the Chooser to access folders made available through System 7 file sharing. To access a shared folder, select the AppleShare icon and then choose the name of the appropriate Mac from the scrolling list. After connecting as a guest or registered user, select the folder(s) you want to share and they'll appear on your desktop.

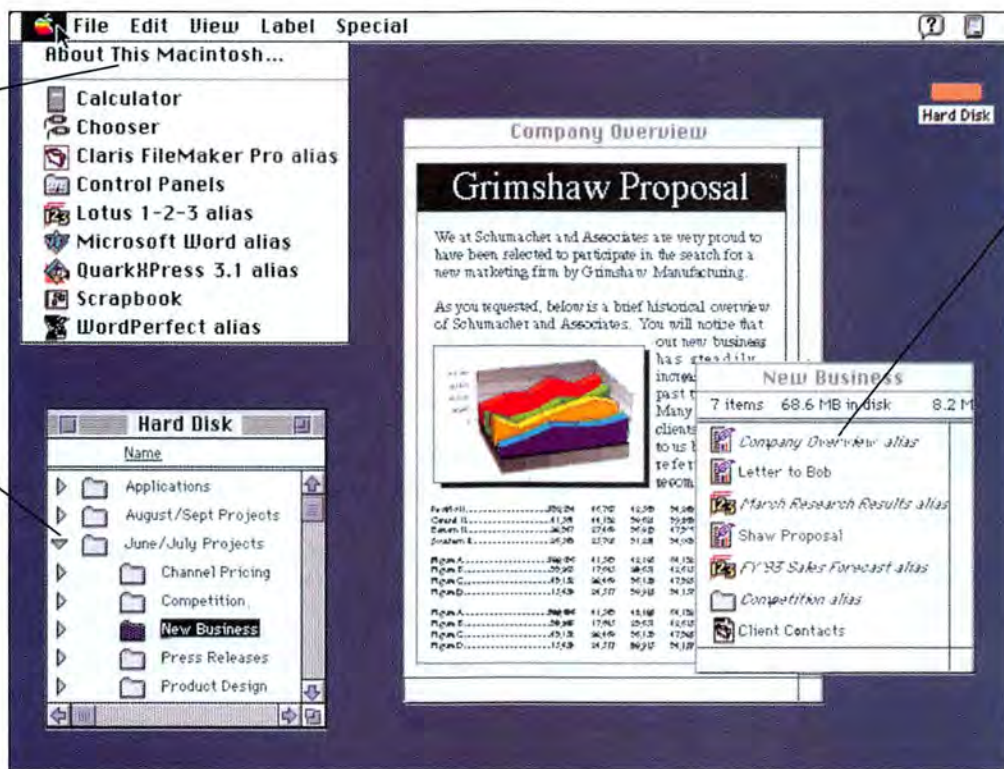


The System 7 Chooser can display more devices and zones, and it's the access point for file sharing. To access a folder shared by another network user, you select it from the list of AppleShare volumes.

How to do an honest day's work by using an alias.

The new Apple menu allows you to easily access anything on your Macintosh—files, applications, desk accessories, control panels, whatever—by simply placing it in your Apple Menu Items folder.

The Outline View feature lets you examine files inside a folder without having to open up a new window. Clicking on this triangle creates a drop-down list of that folder's contents.



Creating an alias is a great way to organize your projects so that files and applications can be in several places at once. Click on the "Company Overview" alias here, for example, and you actually open the original file containing your proposal to Grimshaw.

Finding information fast with System 7.

System 7™ software comes with an array of new tools that makes accessing information on your Macintosh® easier and quicker than ever.

To begin with, you can create an "alias." Designed to help you better organize your hard disk, aliases are not full-fledged copies of files but, rather, small 2K "pointers" to files, folders and applications, which you can put in as many places on your Mac® as needed. When you click on an alias, you actually open the original—no

matter where it's located.

The new Find feature lets you search for files, folders and applications, and then actually brings them right to the front of your desktop for you.

And with Outline View, simply clicking on the triangle to the left of the folder icon creates a menu list of its contents. So you never fill up your computer screen with multiple windows trying to find that buried file.

Of course, these are just a few of the ways



System 7 can help make you more productive.

They're also just a few of the many reasons why 5 million Macintosh users are now working with System 7, as well as with the more than 6,000 applications available that run on it.

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And let System 7 give you the power to find what you have always been looking for. The power to be your best.®



21 Enhancing Linked Data

The publish and subscribe capabilities in System 7 let you incorporate "live" text and graphics from other programs into your documents. When the original information changes, your documents are updated automatically.

Although all programs that support publish and subscribe let

you position and resize subscribed material, Deneba's Canvas 3 goes further. Through its adornment features, you can enhance subscribed text by changing the font, point size, style, justification, and color.

With subscribed graphics, you can change attributes such as color, pen size, fill and pen patterns, and rotation angle.

These adornments are retained when the subscribed text and graphics



are updated. You can also return a subscribed object to its original condition with the Remove Effects command.

22 Rebuilding Your Desktop

At least once a month, you should rebuild the invisible Desktop files that System 7 uses to track files. This

Workgroups of the Future



Apple continues to place the latest technologies in the hands of both users and network administrators, providing easier, more flexible ways to accomplish your goals. Two of the newest system extensions, the Apple Open Collaborative Environment (AOCE) and AppleScript, will simplify collaborative computing and allow you to automate routine tasks, integrate your applications, and customize the desktop. AppleScript is available now; AOCE will be available later in 1993.

Getting the Message

AOCE addresses the growing need to communicate with colleagues through a variety of electronic means, including fax, electronic mail, voicemail, and on-line services. Because each system has a different interface, you may spend a lot of time retrieving, handling, and replying to messages.

AOCE saves you time and energy by combining all of these communications systems into a single easy-to-use interface. A desktop mailbox receives and stores all forms of correspondence, and a personal directory stores data about other users, such as their preferred method of contact.

You simply create a document and address it. AOCE, together with third-party software, handles the transmission—whether it's sending a fax from your Mac, exchanging E-mail over the local network, or dialing up an on-line service via modem. AOCE also provides digital signatures, which let you attach electronic approvals to documents, and authentication services, which ensure that messages are private and secure.

Software developers are incorporating AOCE technology into applications ranging from calendaring utilities to spreadsheets, allowing you to send formatted text, pictures,

sound, and movies from within your favorite programs. A Send command will eventually be as common as the Print command is today.

"No Hands" Computing

You can streamline routine computing tasks even further by combining AOCE's capabilities with those of AppleScript, Apple's powerful yet easy-to-use scripting language. You could, for example, create a script (a series of commands) that automatically answers, forwards, files, or deletes incoming messages based on their subject matter.

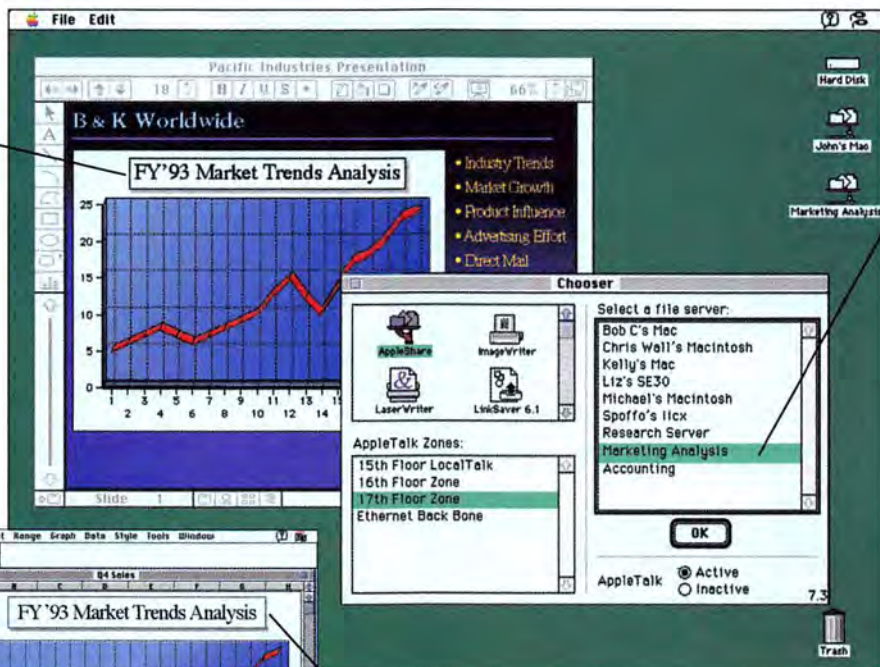
AppleScript lets you tailor the computing environment to your needs. You can write scripts that automate routine tasks (such as file backups), perform unattended processing (spreadsheet calculations, perhaps), and automatically gather information from various sources (E-mail or database records). AppleScript also simplifies network administration, allowing you to automate disk backups and software updates.

For even greater power, you can use AppleScript to integrate the functions of several applications into a single, seamless working environment. This is especially useful to VARs, system integrators, in-house developers, and consultants because it makes it easier to create custom solutions for clients. By writing scripts, they can turn off-the-shelf applications, such as accounting and forms packages, into front ends for comprehensive workgroup systems such as small-business accounting or sales-order processing.

To facilitate user scripting, developers are building AppleScript capabilities into their software. Scriptable applications, such as Microsoft Excel 4.0, can run pre-existing scripts; recordable applications, such as StuffIt Deluxe 3.0.5, can create their own. Apple will also roll a run-time version of AppleScript, which lets users create and run scripts, into a future release of the system software.

How to pull together 3 months of research in under a minute.

File sharing makes it easy for Macintosh users to exchange information and work together over a network. So, for example, you could pull this "FY '93 Market Trends Analysis" chart from your colleague's computer and incorporate it into your "B & K Worldwide Sales Report" in a matter of seconds.



Each Macintosh user determines which files are shared with which people. To access the chart on your colleague's Mac, you simply open the Chooser and select your colleague's file server or desktop computer name. Which, in this case, happens to be "Marketing Analysis."



You can give people access to your Macintosh and allow them either to change files or only look at them. In this example, your colleague has given you access to this "Market Trends Analysis" chart through a folder you both share on his Mac. You simply copy the chart into your presentation slide.

File sharing with System 7.

With System 7™ software and its built-in file sharing, putting together a presentation on your Macintosh® has never been easier or quicker. Even when the research you need for it is in someone else's computer.

Now, despite the fact that you and your colleagues may have different schedules, you can still collaborate on a project over your network. Because file sharing enables you to work with files on each other's computers.

You simply give your associates access to any

designated file or folder on your Macintosh, and they can work with your data from their computers.

So let's say, for instance, that your boss walks into your office and asks to see where you're at with your quarterly research summary. But the June findings happen to be on your partner's Mac®, and she's out to lunch.

No problem. With file sharing, you can access your partner's data in moments.

Of course, this is just one of the many ways



System 7 can help make you more productive.

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And see how easily System 7 can give you the power to pull your work together fast. The power to be your best.™



MYTH
My applications
won't work with
System 7.

FACT
More than 6,000
applications are fully
compatible with System 7,
including some previous
versions of many
popular programs.

simple procedure
fixes any internal
Desktop problems
and speeds basic
operations such as
starting up the
Mac, copying
files, and

switching to
the Finder.

In addition,
if you

install a new application or upgrade an existing one, you may have to rebuild your Desktop to see the correct icons for the program and its documents.

To rebuild the Desktop when you restart the Mac, hold down the Command and Option keys after the extensions finish loading but before the menu bar and desktop appear. Click OK when asked if you want to rebuild the Desktop.

Did you know you can rebuild the Desktop *without* rebooting the Mac? In the Finder, with no applica-

tions running, press Command-Option-Escape. Click the Force Quit button in the resulting dialog box, then hold down the Option and Command keys. If your keyboard doesn't have an Escape key, use the ~ (tilde) key instead.

24 Creating an Upgrade Server

If you're a network administrator, you know how hard it is to keep users current with the latest releases of system software.

You may, in fact, be avoiding the move to System 7 because you don't want to visit each user's Mac or loan out your master set of System 7 disks.

Fortunately, there's a simpler solution: an upgrade server. This setup allows users to install their



own system software over the network instead of using floppy disks. Plus, as each system release appears, you need only install it in one location to make it available to everyone on the network.

To set up a System 7 upgrade server, create a folder on your AppleShare server (or on a shared disk) and name it something like Network Installs. Insert the Install Me First disk from your System 7.1 MultiPack into the Mac and drag its icon onto the server's hard disk to copy the disk's contents into a folder named Install Me First. (For System 7 packages without this disk, start with the Install disk.) Move the new folder into the Network Installs folder and eject the disk. Follow this same procedure with the Install, Install 2, Printing, Fonts, and Tidbits disks.

The Network Installs folder should now contain six folders, one for each installation disk. Move the Installer and Install Script files from the Install Me First folder to the main Network Installs folder. Finally, set the access privileges for the Network Installs folder so that everyone on the network can use it.

Congratulations! Your users now have a one-stop source for system software upgrades, and your life just got *much* easier.

23 Express Yourself with Zeal

If you're designing a logo or presentation and plain text seems too, well, *plain*, dress up your act with Zeal, Apple's new TrueType symbol font. Zeal's 256 characters include symbols that are both practical and fun, such as recycling and recreation icons, horoscope signs, arrows, map symbols, and clocks depicting each hour of the day.

give
generously



You can put Zeal to work in dozens of creative ways, from borders and bullet points to ornaments and logos. And you don't have to think small. Zeal lets you make a really *big* impression—on signs, posters, even T-shirts—because TrueType, Apple's scalable font technology, ensures smooth, crisp-looking characters at any point size, both on-screen and on paper.

Zeal is one of 43 TrueType fonts in the Apple Font Pack, a collection of high-quality text, display, and symbol fonts that help you create better-looking documents.

shoot
for the
stars



Stay In
School

25 Opening MS-DOS Documents

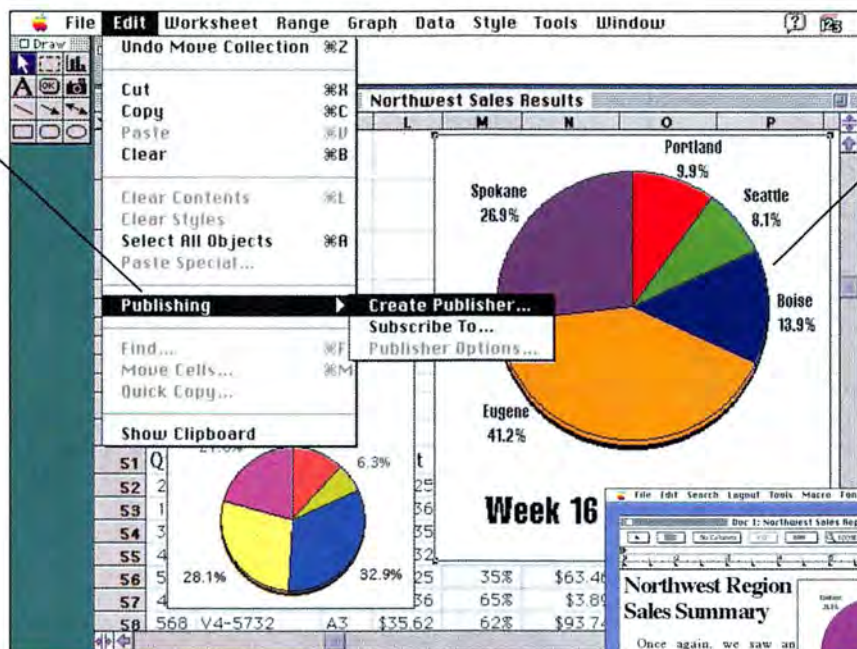
The Macintosh PC Exchange extension from Apple lets you open and work with MS-DOS and Windows files on your Mac. Although MS-DOS files can be opened from within Mac applications, double-clicking a MS-DOS



file's icon usually won't open it because the document doesn't know which Mac application to use.

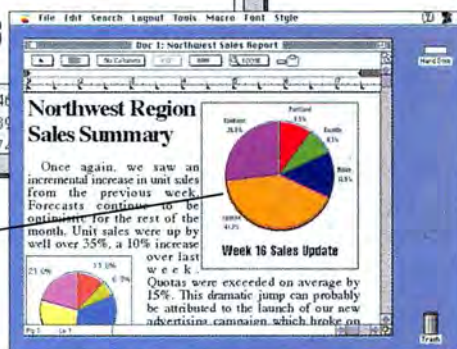
How to make sure your pies are always fresh.

System 7 lets you create "live links" between documents from different applications with a tool called Publish and Subscribe. By "Publishing" a chart from one document, you can "Subscribe To" it and place it in any number of other documents. When you update the original, all the other charts linked to it are updated automatically.



Select the item you want to publish—in this case, a pie chart in your spreadsheet. Go to the Edit menu and choose "Create Publisher." That's all there is to it. Now your chart is ready for you and others to subscribe to.

From your word processing document, select "Subscribe To" in the Edit menu, and you've placed a copy of the chart in your sales summary. When you make changes to the original chart, this new one will be updated automatically to reflect the changes.



Up-to-date documents with System 7.

With System 7™ software and a built-in tool called Publish and Subscribe, keeping reports and documents up to date is as easy as, well, you know what.

For instance, let's say you're working on a sales report in Microsoft Word. Let's also say that you've created a pie chart in a Lotus 1-2-3 spreadsheet showing your company's most recent sales results, and you want to include this chart in your final report.

Experience tells you, however, that these

sales figures will continue to change right up to the very last minute.

No problem. With the Publish and Subscribe feature, you can publish the pie chart from your spreadsheet and then subscribe to it from within your word processing document.

This creates a "live link" between the two. Now, each time you revise the sales figures in your Lotus spreadsheet, the pie chart will automatically reflect the changes. So your final report will always be revised and up to date.



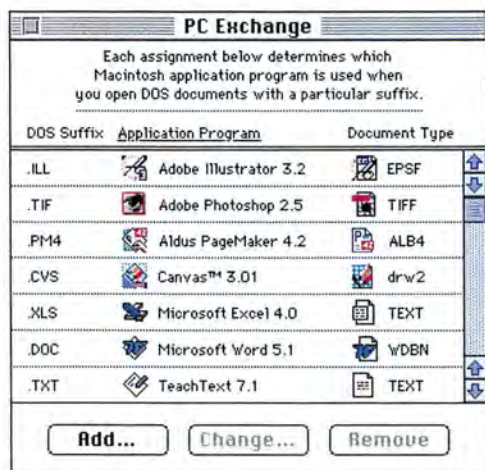
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And then see how System 7 can give you the power to keep all your ideas fresh. The power to be your best. Apple





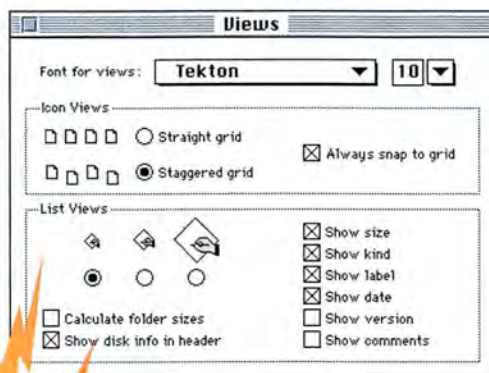
Macintosh PC Exchange lets you assign a Mac application to an MS-DOS extension. All MS-DOS documents with the extension can then be opened with a double-click.

You can fix this by using the PC Exchange control panel to assign Mac applications to MS-DOS documents. For example, you could specify that all MS-DOS files with names ending in .WK3 be opened with Lotus 1-2-3 for Macintosh.

From now on, whenever you double-click MS-DOS documents with .WK3 extensions, they will open automatically in Lotus 1-2-3. (The list of assignments is stored in the PC Exchange Preferences file, which is kept in the System Folder's Preferences Folder.)

Would you like everyone in the office to use the same application assignments when opening MS-DOS files on the Mac? Make a master list of assignments on one Mac, then place a copy of the PC Exchange Preferences file in the Preferences folder of each licensed user of Macintosh PC Exchange. (Make sure you don't change the filename.)

The Views control panel lets you adjust the appearance and content of Finder windows to meet your needs.



26 Opening Files at Startup

Do you use certain programs or documents all the time? If you put their aliases in the Startup Items folder, System 7 will open them automatically at startup time. (By using aliases, you can store the original items in more convenient locations.)

Want your Mac to play a favorite sound when you turn it on? Drag the appropriate sound file into the Startup Items folder. How about a QuickTime movie? Rename the movie Startup Movie and put it in the Startup Items folder. Now it will play each time you start the Mac.

Fast Fact: If for some reason you don't want the startup items to load, hold down the Shift key as soon as the extensions have finished loading but just before the desktop appears.



Views control panel, which lets you tidy up icon views and make list views more informative.

For icon views, you can select a staggered icon grid to keep filenames from overlapping and/or insist that icons always snap to a grid (normal or staggered). For list views, you can choose the information you want displayed with each file, including size, kind, label, version, and comments. You can also opt to show file icons in list views, as well as disk information ("34.5 MB in disk, 3.4 MB remaining"), a feature lamentably missing from System 6.

Last, but not least, you can change the font and point size used to display text, such as icon names and list views, in the Finder.



28 Fetching Files

By now you know that aliases are one of the most powerful features of System 7, allowing you to organize your hard disk however you want while providing instant access to files, even if you move or rename them.

But did you know that applications also can use aliases to track files? Aldus Fetch, a mixed-media cataloging program, is one of several applications that uses the alias capabilities of System 7 to locate and retrieve files.

Fetch stores an alias for every image cataloged in its database. When you ask Fetch to retrieve a particular image, it hands the alias to System 7 and asks it to locate and open the original file. Depending on the file's location, you may be prompted to insert a CD-ROM disc, mount a file server, or even dial up a remote network.



Making the Move to System 7



Still running System 6.x software? Upgrading to System 7 is easier than you may think. And once you discover how much more productive you are under System 7, you'll be glad you made the move. Here are answers to some commonly asked questions about switching to System 7.

■ System 7.1 is the current version of the Macintosh system software. Released in October 1992, System 7.1 is shipped with all Macintosh CPUs worldwide.

■ System 7.1 requires a hard disk, and we recommend 4 megabytes of RAM. System 7.1 is shipped on 1.4-megabyte floppy disks, but if you don't have a SuperDrive, you can exchange the high-density disks for 800K disks by calling Apple at 800-769-APPL.

■ Individual users can upgrade with the System 7.1 Personal Upgrade Kit (\$99*). To upgrade up to 10 users, you need the System 7.1 MultiPack (\$499*). Both are available from many mail-order and retail outlets; call 800-731-3131, Ext. 500, for the reseller nearest you.

■ Installing System 7.1 requires just one click of the mouse; the Installer program does the rest. In addition to placing the System 7.1 files in their correct locations on your hard disk, the Installer deletes outdated system files and moves third-party extensions, control panels, and fonts into the appropriate folders.

■ Boot your Mac from the System 7.1 Install disk before performing the installation. If you want to run the Installer from your hard disk, turn off your extensions

(INITs) first. You don't have to remove your applications prior to installing System 7.1.

■ Before installing System 7.1, run Compatibility Checker 2.0, which is included in the upgrade kits. This diagnostic tool analyzes your extensions, control panels, and applications, flagging those that should be upgraded. It can automatically move incompatible extensions to a special folder, allowing you to run System 7.1 without mishap. Compatibility Checker 2.0 is also available from on-line services and Mac user groups. On ZiffNet/Mac (the on-line connection to MacUser, hosted on CompuServe), you'll find it in Library 14 of the Download & Tech Support Forum (GO ZMC:DOWNTech). The filename is CCHECK.SIT.

If You Already Use System 7.0...

Users of System 7.0 and 7.0.1 can move to System 7.1 by purchasing the System 7.1 Update Kit (\$34.95*), available from mail-order and retail outlets or directly from Apple (800-769-APPL, Ext. 250).

System 7.1 is a minor update. You should get it if you want the enhancements listed below or haven't acquired the System 7 Tune-Up.

What's new in System 7.1? The Fonts folder provides easy installation and centralized storage of TrueType, PostScript, and bit-mapped fonts, and file sharing has improved security settings. Tune-Up has been integrated into the system software, and the QuickTime 1.5 extension is included with the update.

* manufacturer's suggested retail price.

29 Snapping Screen Shots

Need to capture your desktop for posterity? Press Command-Shift-3 to get a color snapshot of the entire screen, including the menu bar and all open windows on the desktop. There's even a camera-shutter sound effect.

You can take as many pictures as you like. Each screen shot is saved to disk as a sequentially numbered PICT file. Double-clicking one of

these files will open it in TeachText 7.x for viewing and printing. If you want to edit the image, you can open it from within a graphics program such as Photoshop, DeskPaint, or Canvas.

30 Easy Network Access

There are probably a few folks, such as clients or visitors, who need to use your network occasionally but

don't want to learn networking procedures. No problem.

Simply make a shared folder for each person and place in it whatever files you want them to be able to access, including aliases of documents stored elsewhere on the network. Give each person a floppy disk that contains an alias of his or her folder.

Now all these novice users have to do is insert the disk into any Mac on the network and double-click the folder's alias. Voilà—they have instant access to their own shared folder.

Take Off with System 7 and Save!

Apple wants everyone who uses a Macintosh computer to experience the power unleashed by its award-winning System 7 software. So, between now and June 30, you can save from \$5 to \$20 on 55 of your favorite Macintosh programs when you buy System 7.

For example, purchase After Dark with System 7, and you'll get a check for \$5 from Berkeley Systems. Buy ClarisWorks with System 7, and you'll receive \$10 from Claris. Or buy any of the other listed programs along with System 7, mail in your rebate coupon, and you'll receive a check for the specified amount.

So get ready to take off!

After Dark, Berkeley Systems	\$5 rebate	Microsoft Excel, Microsoft Corp.	\$20 rebate
Aldus Gallery Effects, Aldus Corp.	\$10 rebate	Microsoft FoxBASE+, Microsoft Corp.	\$20 rebate
Aldus IntelliDraw, Aldus Corp.	\$10 rebate	Microsoft PowerPoint, Microsoft Corp.	\$20 rebate
Aldus PageMaker, Aldus Corp.	\$15 rebate	Microsoft Project, Microsoft Corp.	\$20 rebate
Aldus Personal Press, Aldus Corp.	\$10 rebate	Microsoft Word, Microsoft Corp.	\$20 rebate
Aldus Persuasion, Aldus Corp.	\$15 rebate	Microsoft Works, Microsoft Corp.	\$20 rebate
Aldus SuperPaint, Aldus Corp.	\$10 rebate	Norton Utilities, Symantec Corp.	\$20 rebate
Anti-Virus, Central Point Software	\$20 rebate	The Playroom, Brøderbund Software	\$5 rebate
Apple Font Pack, Apple Computer Inc.	\$15 rebate	Prince of Persia, Brøderbund Software	\$5 rebate
Arthur's Teacher Trouble, Brøderbund Software	\$5 rebate	Quicken, Intuit	\$5 rebate
BannerMania, Brøderbund Software	\$5 rebate	Reader Rabbit 1, The Learning Company	\$5 rebate
The Cathy Daily Planner, Amaze Inc.	\$10 rebate	Reader Rabbit 2, The Learning Company	\$5 rebate
ClarisWorks, Claris Corp.	\$10 rebate	Safe & Sound, Central Point Software	\$10 rebate
DiVA VideoShop, DiVA	\$20 rebate	SAM, Symantec Corp.	\$15 rebate
The Far Side Daily Planner, Amaze Inc.	\$10 rebate	Spelunx, Brøderbund Software	\$5 rebate
FileMaker Pro, Claris Corp.	\$10 rebate	Star Trek: The Screen Saver, Berkeley Systems	\$5 rebate
FileRunner, MBS Technologies Inc.	\$15 rebate	Super Solvers Midnight Rescue!, The Learning Company	\$5 rebate
Just Grandma and Me, Brøderbund Software	\$5 rebate	Super Solvers OutNumbered!, The Learning Company	\$5 rebate
Kid Pix, Brøderbund Software	\$5 rebate	Super Solvers Spellbound, The Learning Company	\$5 rebate
Kid Pix Companion, Brøderbund Software	\$5 rebate	The Trivial Pursuit Daily Planner, Amaze Inc.	\$10 rebate
LetterPerfect, WordPerfect Corp.	\$10 rebate	TypeStyler, Brøderbund Software	\$10 rebate
Lotus 1-2-3, Lotus Development Corp.	\$20 rebate	Where in the World Is Carmen Sandiego/Deluxe, Brøderbund Software	\$5 rebate
Lotus 1-2-3 Upgrade, Lotus Development Corp.	\$20 rebate	WordPerfect, WordPerfect Corp.	\$20 rebate
MacGlobe, Brøderbund Software	\$5 rebate	WordPerfect Works, WordPerfect Corp.	\$10 rebate
Macintosh PC Exchange, Apple Computer Inc.	\$15 rebate	The Writing Center, The Learning Company	\$10 rebate
MACTools, Central Point Software	\$20 rebate		
MacUSA, Brøderbund Software	\$5 rebate		
MacWrite II or MacWrite Pro, Claris Corp.	\$20 rebate		
Math Rabbit, The Learning Company	\$5 rebate		

For more details on this exciting rebate offer, contact one of the companies listed below.

Waldensoftware
800-443-7359

ELEK-TEK
The Computer Wonderland
800-395-1000

MacWAREHOUSE
800-255-6227

Mac'sPlace
800-367-4222

COMPUTER CITY
800-826-3928

EGGHEAD SOFTWARE
North America's Software Experts
800-EGGHEAD

COMPUSA
THE COMPUTER SUPERSTORE
800-451-7638

MacConnection
800-800-9520

electronics boutique
800-800-5166

TigerDirect
800-666-2562

The Mac Zone
Established 1986
800-248-0800

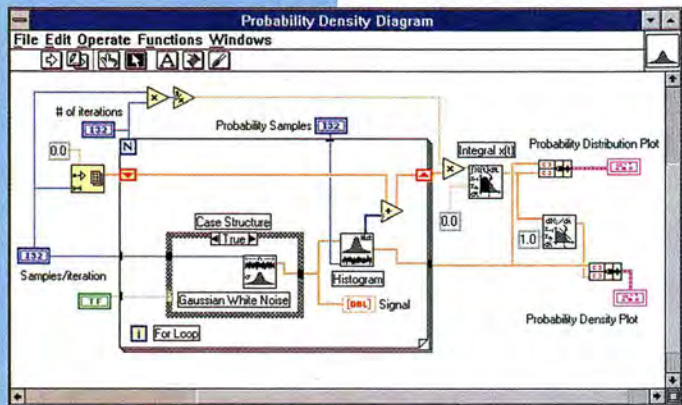
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To order system software from the Apple Catalog, call 800-795-1000 (24 hours a day, 7 days a week). International readers can reach Apple by calling 408-996-1010.

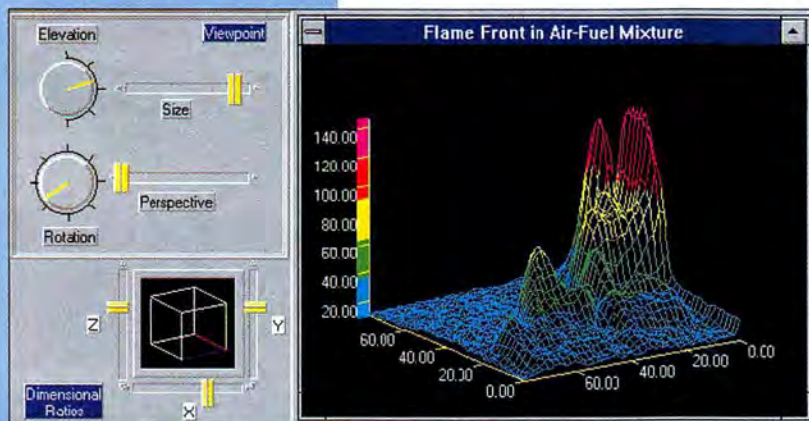
CONTENT: AILEEN ABERNATHY DESIGN: KATHY MARTY ILLUSTRATIONS: PETER HOEY



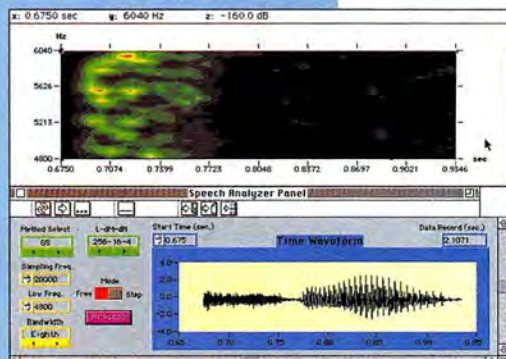
Draw Your Complete Analysis Solution with LabVIEW® Graphical Programming



LabVIEW is a complete graphical programming language.



Surface plot of a flame front using LabVIEW and the SurfaceView toolkit.



Data courtesy of NIH.



The Gabor Spectrogram displays a portion of the sentence "I take two people out for breakfast," computed and displayed with LabVIEW.

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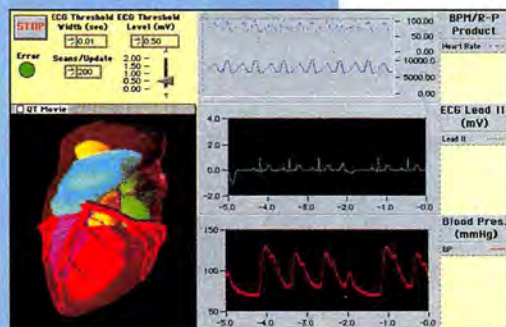
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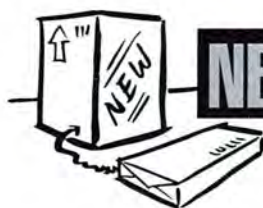
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NEW ON THE MENU

A little more QuickTime and a first piece of PIE: Apple continues to tweak **QuickTime**; the latest incremental rev is version 1.6. Users should see about a 10-percent improvement in speed overall, which means a slightly faster frame rate and, thus, smoother motion.

QuickTime sound has also been improved. The new Sound Manager included with version 1.6 lets you incorporate 16-bit (audio-CD quality) sound samples into your movies in either of two ways: software only or with additional hardware. If you don't have a 16-bit audio card, such as Digidesign's Audiomedia board, the Sound Manager will dither your 16-bit sample down to 8 bits for the Mac's internal audio circuitry. If you have the additional hardware, it will automatically route the sound sample to the card.

Apple's PIE (Personal Interactive Electronics) Division has finished baking its first goodie, and much to no one's surprise, it isn't the Newton. Instead, it's the **PowerCD**, a more-than-3-pound, transportable (if not maximally *portable*), multi-format (audio-CD, CD-ROM, and Photo CD), less-than-\$500 drive that looks like a prop from a Batman movie.

The PowerCD's biggest cachet is its support for NTSC video output, so you can just plug it in to your TV set and start looking at your Photo CD images.

But much like those of Apple's Select laser printers, the PowerCD's features are singularly odd. For example, you can separate the drive mechanism (that's the Frisbee-

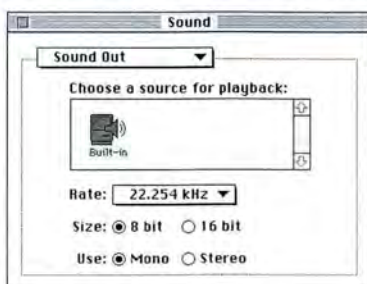
like part) from the base, but you can't do anything with it. All the data ports and power ports are in the base. The base houses batteries — eight penlights (AA) — but Apple estimates that the batteries will last only about an hour and a half for data use —

comparable audio-CD players run four times as long on half as many batteries.

The PowerCD comes with a wireless remote control that has enough buttons to intimidate even the VCR-literate.

To top it off, the PowerCD is a slow drive: 150K per second, even though Apple has been pushing 300K per second as the standard since QuickTime 1.5, because the slower speed was unacceptable for QuickTime playback!

So what's PIE's explanation for the PowerCD? It bought it from Philips.



Up to Date . . .

Following a "technology agreement," Objective Software's **SpreadBase 1.1** data-analysis tool will now be able to access SQL databases directly through Brio Technology's **DataPrism 2.1**. The products will be available as a bundle at a cost of \$695. 415-306-7404.

◆ Upgrades down in price:

Apple Computer has lowered the prices on several Mac logic-board upgrades. The Quadra 700 upgrade kit for the IIfx and IICI went from \$3,129 to \$1,999. The Quadra 950 upgrade for Quadra 900 owners is \$1,899 (formerly \$2,679). And the IIfx upgrade (for the II and IIfx) went from \$2,319 to \$1,799. 408-996-1010. 🖱



By Russell Ito



Print photographic-quality color transparencies or prints at low prices with Kodak's new ColorEase PS printer.

Highly Presentable Printing

You can spend lots of time creating dazzling images for your color presentation, but will your printer do them justice? If it's Kodak's new ColorEase PS continuous-tone thermal-dye-transfer printer, the answer is yes. With three color passes (CMY — or cyan, magenta, and yellow) at 300-dpi resolution, the ColorEase PS can print photographic-quality transparencies (and prints), using more than 16 million colors.

Aimed at the color-presentation market, the ColorEase PS prints transparencies optimized for the light-source location of the projector you're planning to use.

It also has plenty of power to cope with complex images: a 40-megahertz SPARC RISC processor, 16 megabytes of RAM, two SCSI ports for extra font storage, and Adobe PostScript Level 2 firmware. Plus, its 120-megabyte internal hard drive enables it to process one image while *simultaneously* printing another — a convenient feature when you're sharing the printer (parallel, serial, and LocalTalk ports are standard; Ethernet is optional).

Except for being limited to letter-sized (A or A4) paper, the ColorEase PS is similar to the Eddy Award-winning Kodak XLT 7720, its bigger, premium-priced cousin. Considering that it's one-third the XLT 7720's price and has a lower cost per page (\$2 for prints and \$2.50 for transparencies), how can you go wrong?

Eastman Kodak Co., 901 Elmgrove Road, Rochester, NY 14653; 800-344-0006 or 716-724-4000. \$7,995.

— Tony A. Bojorquez

A Pro PIM

Keeping track of your contacts and appointments is a hot topic, which is what keeps the PIM (personal information manager) war raging. After Hours Software has just launched its latest attack, with two new packages: TouchBASE Pro and DateBook Pro. The packages are highly integrated (via Apple events) and available in a bundle as well as separately.

While perusing your contacts in TouchBASE Pro, you can view all the DateBook Pro appointments, to-do items, and calendar memos associated with a specific contact. You can view and access all of your TouchBASE Pro contact information in DateBook

Pro; you can even go directly to a specific contact record, dial the person's telephone number, send a fax, or print a letter.

TouchBASE Pro includes several features that TouchBASE users have long requested. A mini word processor in the program lets you quickly write, address, and track letters. Data entry has been speeded up with shortcuts such as "clairvoyance," which automatically enters a user-defined text string after you've typed a few characters. TouchBASE Pro can automatically convert Dynodex and Address Book Plus files, and you can now copy and paste among TouchBASE Pro files as well as have multiple files open simultaneously. The contact limit has been increased to 32,000, and you can create and save complex search routines. For PowerBook users, TouchBASE Pro has transaction-log-based file reconciliation, so you can keep two files in sync even if you've deleted records.

DateBook Pro has some helpful new features as well. You can have memos that aren't to-do items or events in your DateBook Pro file, and you can access your events, to-do items, memos, and alarms without launching the DateBook Pro application, thanks to the program's new Mini Window. You can customize your DateBook Pro view in several ways, and you can keep track of holidays and

vacations — so you don't accidentally schedule meetings when you won't be anywhere near the office.

After Hours Software, Tri Center Plaza, 5990 Sepulveda Blvd., Van Nuys, CA 91411; 818-780-2220. DateBook Pro, \$79.95; TouchBASE Pro, \$79.95; Pro Bundle, \$149.95.

— Russell Ito

Print Fast or Fine

Used to be, you had to give up on speed if you wanted a reasonably priced laser printer with high-resolution output. Not anymore. The new IBM LaserPrinter 4039 series, from Lexmark, IBM's printer-division spin-off, gives you 600-dpi resolution for high-quality output at 8 ppm plus a 300-dpi option for faster printing — at 10, 12, or 16 ppm, depending on the model you choose. And the price range is right: from \$1,599 for the low-end 10R model to \$3,399 for the top-of-the-line 16L.

The five printers in this series (the 10R, 12R, 12L, 16R, and 16L) offer many useful features, including a RISC processor for fast processing of complex documents, a duplexing option for double-sided printing, PCL 5 and PostScript compatibility (through a Phoenix/Lexmark interpreter), software updates for easy upgrading, and PictureGrade gray-scale enhancement technology



Quickness or quality? With the IBM LaserPrinter 4039 printers, you get both options: high-quality 600-dpi resolution at 8 ppm or 300-dpi output at 10, 12, or 16 ppm (depending on which model you buy).



Creating QuickTime special effects is a snap with version 1.5 of VideoFusion. It's faster than 1.0 and includes such new features as finer adjustment of control points for smoother morphing.

(similar to Apple's PhotoGrade) for 100 levels of gray.

Serial and parallel ports are included on all models, and you can buy optional interfaces for LocalTalk, Ethernet, and token ring. EtherTalk compatibility (that's Ethernet for Macs) will be available late in 1993. All ports are active simultaneously — Lexmark's Smartswitch technology lets any model spool and print jobs from different ports at the same time.

Lexmark International, Inc., 740 New Circle Road N.W., Lexington, KY 40511; 800-358-5835 or 606-232-2000.

— Sean Safreed

Specially Effective

If you're using VideoFusion to create whizzy QuickTime special effects, you're about to become a lot more efficient. Version 1.5 of the program, available free to version 1.0 owners, has been internally optimized — its maker claims it's 50 percent faster than the original.

You also get improved controls for morphing and support for Adobe Photoshop's filmstrip format (so you can apply Photoshop filters to groups of frames). Plus, a new recording window enables you to digitize video clips from within VideoFusion.

Finally, version 1.5 offers several new features to warm the hearts of video professionals: field rendering, which

provides smooth edges on graphics and composited video windows; an NTSC-safe filter, which converts colors to fit the NTSC TV standard; and support (in an \$89 software add-on) for RISC accelerators from YARC, which lets the application use these RISC accelerators to speed up CPU-intensive operations on some filters.

VideoFusion Ltd., 1722 Indian Wood Circle, Maumee, OH 43537; 419-891-1090. \$649.

— Mark Frost

VideoShop Gets Rebuilt

Since its introduction, DiVA's VideoShop has been a powerful QuickTime-video-editing tool — for users who didn't mind its cumbersome HyperCard-based implementation. Version 2.0, rebuilt from the ground up, breaks free of HyperCard and offers enhanced sound-mixing and video-compositing features.

Two new add-on tool kits provide special tools for two types of output: digital and analog. The Digital Delivery Kit lets users drag and drop movies directly into HyperCard or create interactive movies as self-contained applications. The Analog Tool Kit is for video professionals who want to link up with controllable video decks; it provides device control, lets users access SMPTE time code for frame-accurate editing, and lets users generate Edit

NewsLine

Reports and Analysis

Apple Pursues Multimedia Markets

CUPERTINO, CA — Signaling its intent to claim a large share of the emerging multimedia market, Apple has formed the New Media/New Markets Group. The group's goal is to increase the use of multimedia in both mainstream personal computing and specialized markets such as transportation and medical imaging (and to ensure that Apple will be supplying the right products for these markets). In addition to launching an aggressive CD-ROM marketing campaign and a Multimedia Developers Program, the group has announced an agreement with Macromedia to bundle that company's multimedia software with Macs containing CD-ROM drives. Agreements with other companies such as Radius, DiVA, Voyager, and Honeywell are in the works.

Real Funding for Virtual Reality

CARY, NC — Bringing virtual electronic worlds a step closer to reality, Motorola has invested an undisclosed amount of money in Virtus, creator of Virtus WalkThrough. This Eddy Award-winning software lets Mac users (and Windows users, by the time you read this) create and then move through 3-D models in real time. With Motorola's backing, Virtus is well positioned to reach out to some of the same interactive-multimedia markets Apple is pursuing.

Tax-Software Vendors Merge

SAN DIEGO, CA — From virtual reality to virtual certainties: For those who do their taxes electronically, ChipSoft has just increased the likelihood that it will supply the software they use. The publisher of TurboTax and MacInTax, ChipSoft has added to its tax-preparation arsenal by purchasing MECA Software, maker of such programs as Andrew Tobias' Managing Your Money and Andrew Tobias' TaxCut.

— Karen J. Ohlson

Decision Lists for broadcast-quality applications.

If all this sounds too high-end for you, you may want to wait for the more basic QuickTime-editing package that DiVA is introducing in August. Its simplified interface and expected \$199 price

will make it an obvious choice for the education market.

DiVA Corp., 222 Third Street, Cambridge, MA 02142; 617-491-4147. VideoShop 2.0, \$499; Digital Delivery Kit, \$399; Analog Tool Kit, \$699.

— Mark Frost



HyperCard-dependent no more: Version 2.0 of VideoShop offers a powerful set of video-editing and -effects features with a more streamlined, non-HyperCard-based interface.

Easy to manage. Our new AppleShare Pro software delivers graphical tools to greatly simplify your server management tasks. So you can spend less time responding to workgroup requests, and more time being productive.

Lower cost of ownership. When server management is easier, it's also less expensive. The ease of use of AppleShare Pro translates into dramatic cost savings over time — in both single-server and multiple-server environments.*

Workgroup strength. The Workgroup Server 95 is a new machine, optimized for workgroups. It's based on the Macintosh Quadra 950, with performance boosted by a processor-direct card with memory acceleration and up to a 512KB cache.

High performance made affordable. AppleShare Pro software exploits the hardware acceleration and high-performance A/UX of the Workgroup Server 95 to deliver up to four times the performance of a Macintosh Quadra 950 running AppleShare 3.0.

Grows with the group. It's easy to keep up with the workgroup as it gets bigger and more demanding. Memory is expandable to 256MB, and there's room to expand disk storage up to 20 gigabytes.



Workgroup Server

We now do for the workgroup wh

When Apple introduced the first Macintosh® computer, we proved that making a desktop computer easy to use could have a dramatic effect on an individual's productivity. Now we're going to repeat that demonstration on a much larger scale: Introducing the Apple® Workgroup Server 95.

It's an easily expanded, high-performance server designed to boost workgroup productivity in data-intensive environments. In typical Apple fashion, it's also designed to be very easy to use — demanding much less attention from you as a network manager.

The Workgroup Server 95 is built for speed and optimized to help large groups of users work together better. Starting with our most powerful Macintosh Quadra™ system, we added hardware acceleration, half a megabyte of high-performance cache memory,



The Workgroup Server 95 not only gives the group a growth path, it lets people do things they couldn't do before. Like streamline electronic publishing with centralized art and text files. Or store and retrieve large documents in a matter of seconds.

*AppleShare administration averages \$10,000 per year less than other systems, according to the Business Research Group (BRG) study "Lifecycle Costing for PC LAN Administration — A Comparative Analysis of 5 Leading NOS Environments." Environments compared were AppleShare, Banyan VINES, Novell Netware, of Apple Computer, Inc. MS-DOS is a registered trademark of Microsoft Corporation. Netware is a registered trademark of Novell, Inc. ORACLE is a registered trademark of Oracle Corporation. OS/2 is a registered trademark of International Business Machines Corporation.

Built-in network support. With Ethernet, LocalTalk, TCP/IP and AppleTalk software built in, the Workgroup Server 95 fits into just about every office environment with a minimum of effort.

Built-in backup. The optional built-in DAT 4mm tape backup drive lets you store gigabytes of information. Dantz Retrospect Remote automated backup software (bundled with the server) lets you safeguard system and data files in UNIX and Macintosh formats.

Database power. The Workgroup Server 95 has the power to drive the ORACLE7 relational database, supporting MS-DOS, Windows, Macintosh, OS/2 and UNIX clients. It also provides enhanced performance for 4D Server from ACI.

Now serving Windows. New software from Apple and Farallon lets MS-DOS and Windows users connect easily to the Workgroup Server 95 and Apple printers.

High-performance support. The AppleAssuranceSM program provides 24-hour phone support to help you set up and start using your server, and on-site service options to keep it at peak performance for a lifetime.

at Macintosh did for the desktop.

enhanced SCSI/DMA driver support, disk I/O, memory expansion to 256MB and disk expansion up to 20 gigabytes.

It's all built around our performance-tuned UNIX[®]-based system software: A/UX[®] 3.0.1. Optimized to deliver stable, dependable file, print and database services as well as UNIX application processing, A/UX features the familiar, intuitive Macintosh interface.

Our new AppleShare[®] Pro software (for file and print services) also delivers industrial-strength performance and reliability. However, ease of use may very well be its most powerful feature.

Built into AppleShare Pro is a set of simple, graphical



With the optional built-in DAT drive and backup software, you can automatically store up to 6GB of data on one 4mm tape cartridge without interrupting the group's day-to-day work.

tools to help you maintain the server, whether you're adding new users, upgrading workgroup software or installing network-wide services like e-mail. It also has sophisticated on-line documentation.

Soon you'll be seeing more new Apple servers and solutions for every size budget. Each one has been designed to help people share information more productively, and to expand as your needs grow. Which means each one can deliver the most important kind of computing power. The power to be your best.[®]

The new Apple Workgroup Server 95



IMAGE EDITING

Adobe Photoshop 2.5

Speed and ease of use sum up Adobe's enhancements to its powerful image processor.

Building on Adobe Photoshop's reputation as the premier professional-level image-processing tool for the Mac, the latest version addresses long-standing performance concerns, provides more-powerful image-effects features, and simplifies several complex operations. In addition, now that a fully file-compatible version is available for PCs running Windows, Photoshop 2.5 becomes the last word in image processing for multiplatform environments.

Behind the Mask

At first glance, Photoshop 2.5 looks and works much like its predecessor. However, experienced users will quickly discover a myriad of differences. Among the most striking are enhancements in the area of masking and alpha channels. Photoshop's new Quick Mask feature greatly simplifies the process of creating a single mask for an image. Using Quick Mask, you create the mask directly on the image (no need for complicated paths and alpha channels), and you can use translucent color to distinguish between the area that's protected by the mask and the area that's not.

One of Photoshop's traditional strengths has been the way it allows users to create multiple masks for an image, save them as alpha channels, and manipulate them. With this capability — which is more powerful than ever in version 2.5 of the program — users can create composite images and an almost unlimited variety of special effects. Photoshop's alpha channels now have almost as much muscle as their counterparts in high-end, dedicated retouching systems. The program lets you simultaneously overlay multiple alpha channels on a color image and paint on any combination of the channels



Adobe Photoshop 2.5

Published by: Adobe Systems, Inc., 1585 Charleston Road, P.O. Box 7900, Mountain View, CA 94043; 415-961-4400.

List Price: \$895; \$149 upgrade for 2.0 owners, \$199 upgrade for CD-ROM version.

— a welcome enhancement. The original image remains visible and unaffected as you edit the channels.

The new floating Channels palette, which lists the color channels (R, G, and B, for example) as well as the alpha channels (or masks) of the active document, provides intuitive controls for making channels visible and active. A pop-up menu in the palette presents other channel operations, such as the New and Delete commands. You can name each alpha channel individually — a long-awaited enhancement — and give each channel a different color and level of transparency. This last capability is extremely helpful when you're viewing

more than one channel at a time.

Because Photoshop saves all alpha channels associated with a particular image in the image file itself, file sizes could grow unwieldy in the previous version. To address this problem, version 2.5 features a new compression scheme that saves considerable disk space: When you save an image with many alpha channels in this version, Photoshop compresses the alpha channels, dramatically reducing the size of the file.

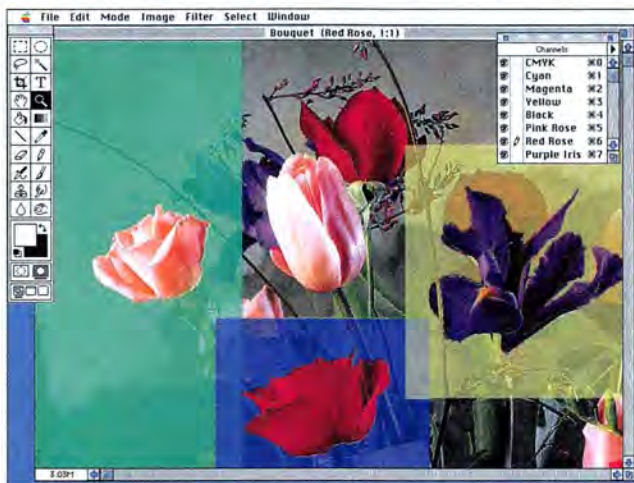
The memory-management scheme of Photoshop 2.5 significantly boosts the program's overall performance, making screen redraws significantly faster. The new version also lets you set a secondary scratch disk — when your first scratch disk runs out of space, Photoshop directs the overflow to the second disk.

Software in Hardware

Even-more-impressive speed gains will be possible through third-party DSP (digital-signal processor) boards, which will accelerate specific calculation-intensive Photoshop functions such as rotat-

ing, resizing, and color-space converting (RGB to CMYK, for example). With the advent of Photoshop 2.5, board makers will be able to license Adobe's own code, which guarantees full compatibility between board-level functions and the Photoshop software. Day-Star Digital, SuperMac Technology, and Storm Technology are among the companies that have announced plans to release Photoshop-specific accelerators under the new licensing agreement. We expect the first of these boards to be available by the time this review appears.

Adobe has also made several of Photoshop's existing



Adobe's latest release of Photoshop features a variety of welcome enhancements. One of the most helpful is the ability to overlay multiple alpha channels on a color image, which remains visible as you edit the channels.

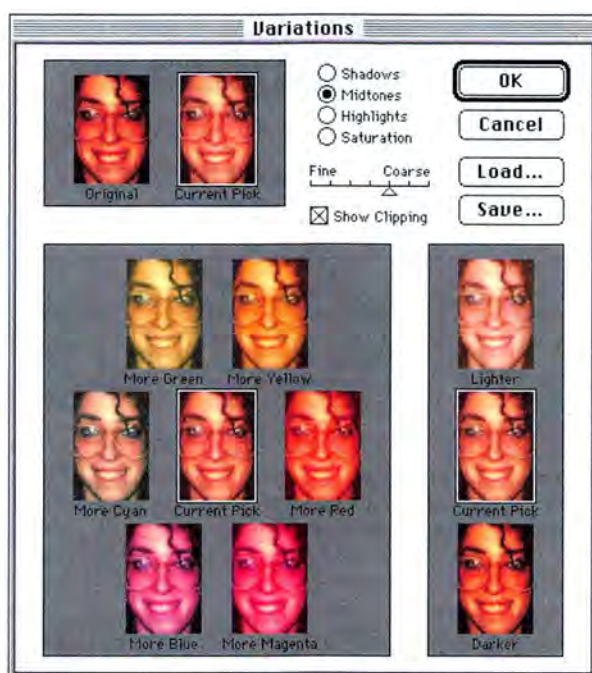
features easier to use in version 2.5. The path tool, for example, was especially frustrating, even for seasoned Photoshoppers. In the new version, Adobe has replaced Photoshop's cryptic path-related keyboard commands with a helpful palette that presents icons specific to each path option.

In addition, version 2.5 supports "unclosed" paths, a key enhancement that gives you the ability to apply strokes to paths with any of Photoshop's painting tools (in its next update, Adobe would do well to add the ability to change brush widths over the length of path strokes). One other useful path-related feature is that Photoshop's TIFF file format can now incorporate clipping paths — only files in the EPS format had this capability in the previous version.

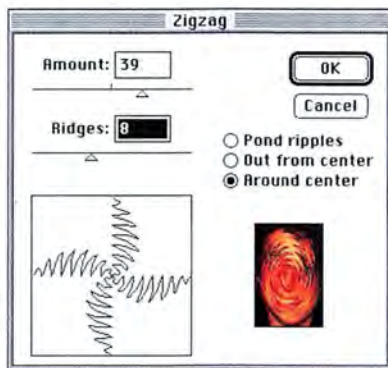
To help users adjust the color balance, contrast, and saturation of an image, Adobe has added the Variations dialog box. It presents a thumbnail of your original image side by side with a thumbnail of the same image with the current settings applied. As you adjust the settings, the second thumbnail changes to reflect your choices. Below the two reference images is a variety of other thumbnails that show how the target image will look with different color-correction settings applied. You simply click on a thumbnail to select its setting. With its Variations dialog box, Photoshop takes a color-correction approach similar to that of several other programs, including EFI's Cachet, but we found Photoshop's implementation to be the most intuitive.

More Special Effects

Expanding Photoshop's special-effects repertoire are several new and fascinating filters. The Shear filter lets you distort images along a smooth, definable curve. The Color Halftone filter creates an impressionistic effect by simulating the result of using an enlarged halftone screen on each channel of the image. It provides full control over CMYK layer rotation and screen frequency. The unique Extrude effect turns an image into a series of square or spiked rods.



Photoshop 2.5's new Variations dialog box lets you adjust color-correction settings simply by choosing an image from a selection of thumbnails that show how the image will look with different settings applied.



An undocumented Photoshop feature lets you opt for wire-frame previews of many filters by holding down the Option key as you select About Plug-in, on the Apple menu.

A very cool and totally undocumented feature in Photoshop 2.5 provides special wire-frame previews for nine of its filters, including Twirl, Ripple, and Pinch. To get the check box for activating this feature, hold down the Option key as you select About Plug-in, on the Apple menu. Then when you select a filter, the wire frame appears.

Together with its major enhancements,

several minor improvements make the new release well worth its \$149 upgrade price. Traditional and digital photographers alike will appreciate Photoshop's new dodge and burn tools, which let you brighten and darken selected images or areas simply by applying paint strokes.

The vastly improved floating Colors palette lets you select an almost unlimited number of colors for foregrounds and backgrounds from the Grayscale, RGB, HSB, CMYK, and Lab color models. To create custom colors, you can mix colors on a scratch-pad area. Photoshop can also sample as many as 256 colors from an image and place them in the Color palette. Once you've configured a Color palette, you can save it for later use. You can also save the positions of floating palettes and controls for use in different work sessions.

Photoshop 2.5 provides many new brush options. You can specify brush sizes as large as 999 pixels (which draw as slowly as you might expect), compared with 64 pixels in the previous version, and you can adjust the softness of brush edges. Another new feature lets you take a snapshot of the current state of an image; you can easily restore specific elements of the snapshot, even after you've invoked Photoshop's Revert command (which causes the program to cancel all changes made to an image since the last time you saved it).

A CD-ROM version of Photoshop, which includes technical notes, sample third-party filters, a collection of clip-art images, and tutorials created in QuickTime, is available to current Photoshop users as a \$199 upgrade.

The Bottom Line

For those who use Photoshop as a creative tool or as a production aid, the latest release features a slew of useful enhancements. With clear advances in performance and power, Photoshop maintains its status as the industry-standard image-processing tool.

— David Biedny

DATA ANALYSIS

SpreadBase

Objective Software's new tool excels at handling large sets of ever-changing business data.

If you're frequently charged with the task of analyzing large sets of complex business data, you may be a candidate for SpreadBase, an innovative new breed of Mac software that marries the familiar interface of a spreadsheet program to the data-management functions of a relational-database program. SpreadBase's strength lies in its ability to handle frequent changes to complex business models with aplomb—changes that often bring traditional spreadsheet programs to their knees.

Category-Based Modeling

SpreadBase pioneers a new approach to data analysis. Called category-based modeling, this approach simplifies the process of model manipulation by organizing individual data items into categories (Products, Regions, and Planned Sales, for example) rather than assigning them to individual cells the way spreadsheet programs do. SpreadBase then associates the categories with fields in an underlying database.

This method greatly reduces the level of detail you must deal with as you manipulate models, because you work with rules and formulas that are associated with the categories and not with the individual data items. With spreadsheets, data relationships as well as the data itself are linked inextricably to rows and columns, so data changes usually require time-consuming remodeling. In contrast, because SpreadBase data is tracked within the database, the program accommodates your data changes automatically.



SpreadBase 1.01
Published by: Objective
Software, 200 Chesapeake Drive,
Redwood City, CA 94063;
415-306-7400.
List Price: \$695.

SpreadBase is designed to handle large data sets imported from corporate databases stored on mainframes or PCs (the program's current model capacity is about 4,000 records). Each category in a SpreadBase model is comparable to a field in a database. This is a big advantage when you import data—the program automatically matches fields in the database with the appropriate SpreadBase categories. Because SpreadBase can combine chunks of data from different sources easily, it's an ideal tool for analysis that involves consolidation. The program handles an impressive assortment of data formats and can connect to SQL-based host systems for data exchange.

The single most difficult aspect of

SpreadBase is properly grouping model data into categories and establishing the relationships among categories. If you're a veteran database user, you'll have a leg up on this task. Spreadsheet jockeys experienced in named ranges and array manipulation will also have a head start.

Managing Changing Data

SpreadBase comprises four modules—Workspace, Macro, Spreadsheet, and Report. You analyze data with the three views available in the Workspace module: Matrix, Sheet, and Chart. To help you gain insight into your data, SpreadBase lets you link views in different workspaces. ModelTalk, the program's macro language, enables you to create customized data-management methods and mathematical functions.

SpreadBase excels at handling modeling scenarios in which the structure of source data remains fixed while data values or the ways in which data is analyzed change. That's because the underlying data relationships remain constant in the database, even though the data itself changes. And creating a different view of your data for analysis purposes is easy, because views are simply different representations of the underlying data stored in the database.

Although SpreadBase does resemble a spreadsheet program in many ways, building SpreadBase models is very different from building spreadsheets. Formulas in SpreadBase are based on category relationships, whereas in spreadsheets, they're based on geometric relationships: No matter how a formula is written, traditional spreadsheet engines convert it into an expression such as "the value of this cell

The screenshot shows the SpreadBase workspace. On the left, a 'Matrix' view displays a hierarchical summary of car sales data. On the right, a 'Spreadsheet' view shows the underlying data table with columns for Region, City, Car, Quarter, and actual sales figures.

Region	City	Car	Quarter	actual
Western	San Francisco	Escort	Quarter 1	18
Western	San Francisco	Taurus	Quarter 1	19
Western	San Francisco	Mustang	Quarter 1	20
Western	San Francisco	Escort	Quarter 2	21
Western	San Francisco	Taurus	Quarter 2	22
Western	San Francisco	Mustang	Quarter 2	23
Western	San Francisco	Escort	Quarter 3	24
Western	San Francisco	Taurus	Quarter 3	25
Western	San Francisco	Mustang	Quarter 3	26
Western	San Francisco	Escort	Quarter 4	27
Western	San Francisco	Taurus	Quarter 4	28
Western	San Francisco	Mustang	Quarter 4	29
Western	San Francisco	Escort	Quarter 1	30
Western	San Francisco	Taurus	Quarter 1	31
Western	San Francisco	Mustang	Quarter 1	32
Western	San Francisco	Escort	Quarter 2	33
Western	San Francisco	Taurus	Quarter 2	34
Western	San Francisco	Mustang	Quarter 2	35
Western	San Francisco	Escort	Quarter 3	36
Western	San Francisco	Taurus	Quarter 3	37
Western	San Francisco	Mustang	Quarter 3	38
Western	San Francisco	Escort	Quarter 4	39
Western	San Francisco	Taurus	Quarter 4	40
Western	San Francisco	Mustang	Quarter 4	41
Western	San Francisco	Escort	Quarter 1	42
Western	San Francisco	Taurus	Quarter 1	43
Western	San Francisco	Mustang	Quarter 1	44
Western	San Francisco	Escort	Quarter 2	45
Western	San Francisco	Taurus	Quarter 2	46
Western	San Francisco	Mustang	Quarter 2	47
Western	San Francisco	Escort	Quarter 3	48
Western	San Francisco	Taurus	Quarter 3	49
Western	San Francisco	Mustang	Quarter 3	50
Western	San Francisco	Escort	Quarter 4	51
Western	San Francisco	Taurus	Quarter 4	52
Western	San Francisco	Mustang	Quarter 4	53
Western	San Francisco	Escort	Quarter 1	54
Western	San Francisco	Taurus	Quarter 1	55
Western	San Francisco	Mustang	Quarter 1	56
Western	San Francisco	Escort	Quarter 2	57
Western	San Francisco	Taurus	Quarter 2	58
Western	San Francisco	Mustang	Quarter 2	59
Western	San Francisco	Escort	Quarter 3	60
Western	San Francisco	Taurus	Quarter 3	61
Western	San Francisco	Mustang	Quarter 3	62
Western	San Francisco	Escort	Quarter 4	63
Western	San Francisco	Taurus	Quarter 4	64
Western	San Francisco	Mustang	Quarter 4	65

SpreadBase is a sophisticated tool for analyzing business data. At the core of each SpreadBase document (left) is an underlying database (right). Each category in the document represents a field in the database. This structure makes SpreadBase a whiz at manipulating and importing large sets of constantly changing data.

equals the value of the cell located 2 columns across in the same row."

With SpreadBase's category-based modeling, the labels you create, as well as their hierarchical relationships with one another, are critical. Good results depend on your planning and building the correct category structure before loading data. You can revise models after you've set them up, but that tends to be cumbersome.

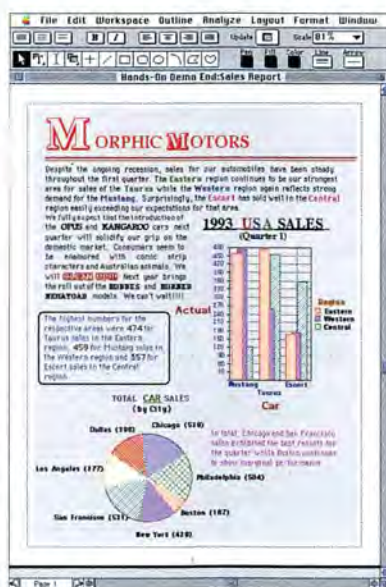
Categories can be either *cell* categories or *label* categories. Only cell categories can contain values. Label categories are the organizational tools that give SpreadBase its power and modeling flexibility. Although SpreadBase views can contain cell formulas similar to spreadsheet formulas, the program's muscle lies in building much more powerful formulas based on categories.

Category Hierarchies

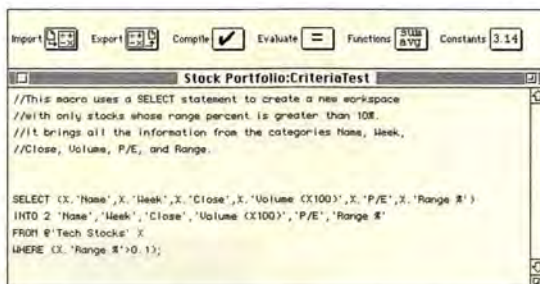
You do most work in SpreadBase in the Matrix view, which looks similar to a spreadsheet. Many cells are fixed, however — you can't enter data into them because they're located in rows or columns associated with label categories, rather than with cell categories.

Like an outliner, the Matrix view displays category hierarchies, which you can collapse and expand at will. Unlike Excel's outline feature, SpreadBase can automatically generate category summaries without making you enter formulas. Moreover, you can easily rearrange matrix elements by dragging tabs located at the edge of matrix rows and columns; however, you can't promote and demote categories by dragging. In contrast, spreadsheet programs make no distinction between the worksheet matrix and the values and formulas stored in the matrix.

SpreadBase's features also invite comparison with those of MUSE, a data-analysis tool from Occam Research (see review, July '92, page 52). We found data import to be more straightforward with SpreadBase, however. On the other hand, ModelTalk, SpreadBase's powerful programming language, is more complicated to use than MUSE's macro language is. And you can't use ModelTalk to create custom interfaces the way you can use Excel's macro language: ModelTalk is designed strictly for building



SpreadBase comes with a Report module (top) that provides basic layout and drawing tools. In addition, you can use the program's powerful programming language to build functions, formulas, and macros, although SpreadBase's macro-editing environment (bottom) is Spartan.



functions, formulas, and macros. With ModelTalk, you can have a single formula act on any number of cell values throughout a model, without using the copy-and-paste fill commands that spreadsheet programs require.

Unfortunately, SpreadBase's macro editor isn't as well designed as other aspects of the program. Its Spartan environment provides only simple buttons for importing, exporting, and running macros and checking the syntax of your code. The Functions button in the macro editor brings up a floating window with selections for SpreadBase's built-in functions as well as for user-defined macros. A check box in the window lets you opt

for a display of each function's arguments. Another button provides easy access to the constants used in models. Overall, SpreadBase does little to encourage the development of large, ambitious macros.

SpreadBase's Spreadsheet module provides basic spreadsheet functions for preliminary work with models. Its Report module provides a modest selection of text and drawing tools. You can place workspace Matrix views, tables, graphs, and spreadsheet data into reports. Because data in reports is hot-linked to workspace data, it's updated automatically when the source data is modified.

By the time this review appears, version 1.1 of SpreadBase should be available. In keeping with the company's plan to expand the program's capacity for data and to enhance its performance, the upgrade will feature a more efficient file format as well as improved memory management. This is key, because SpreadBase models are RAM-resident and a single file can contain multiple workspaces, reports, spreadsheets, and macros. According to the company, version 1.1 models will require about half the disk space required by version 1.0 models. In addition, in comparison with the original release, version 1.1 will

be able to squeeze larger models into a given amount of RAM. The company also plans to enhance SpreadBase's connectivity capabilities by supporting Brio's Data Prism, a powerful SQL connectivity tool.

SpreadBase is clean and well engineered, but because of its depth, the learning curve is steep. Objective Software wisely includes both a printed tutorial and a thorough, disk-based slide show.

The Bottom Line

If you need a tool that's up to importing and manipulating many sets of complex data, SpreadBase may be for you. It's a powerful tool that will handsomely reward the effort required to structure data into the correct categories prior to analysis. The one feature we found unsatisfactory was SpreadBase's less-than-friendly macro language, which would be greatly improved by the addition of a debugger and the ability to create custom interface elements.

— Louis E. Benjamin, Jr.

MODELING

form•Z

This versatile modeling tool from autodessys can create an almost unlimited variety of 3-D forms.

If 3-D-modeling programs were circus performers, then form•Z would be the high-wire artist. form•Z may not be death-defying, but it does challenge many limitations that have characterized 3-D modelers for the Macintosh to date. form•Z is more expensive and more difficult to use than other programs in its class, but it's a star performer that can create a virtually unlimited variety of 3-D objects. The program includes surface- and solid-modeling tools, sophisticated model-editing capabilities, a customizable interface, and terrain-modeling and mesh-sculpting functions.

Model Perfect

The \$1,495 form•Z comprises two modules — one for 3-D modeling and one for 2-D drafting. Because form•Z's creators put most of their efforts into developing the program's impressive surface- and solid-modeling tools, form•Z doesn't have the sophisticated rendering capabilities of an Alias Sketch! or a MacroModel. However, the program makes an excellent modeling complement to dedicated rendering and animation programs.

With form•Z, you have several ways

**form•Z 2.1.5**

Published by: autodessys, Inc.,
2011 Riverside Drive, Columbus,
OH 43221; 614-488-9777.

List Price: \$1,495.

to create 3-D solid objects. You can use defined primitives, revolve or extrude 2-D objects, or use sweeps along paths. Once you've created a 3-D object, you can edit it on the vertex, segment, or face level.

You can also create spline-based 2-D surface objects. Initially, form•Z defines surface objects with sets of either closed or open outlines of the desired shapes. You then select the outlines and specify a mathematical method for generating smooth curves. The program supports NURBS (nonuniform rational B-splines), splines, Béziers, and several less powerful curve-generating methods.

Once you've defined a surface object, you have several options for editing it. You can control the degree of smoothness and the number of polygons used to approximate the surface. form•Z's surface-editing interface isn't as Mac-like

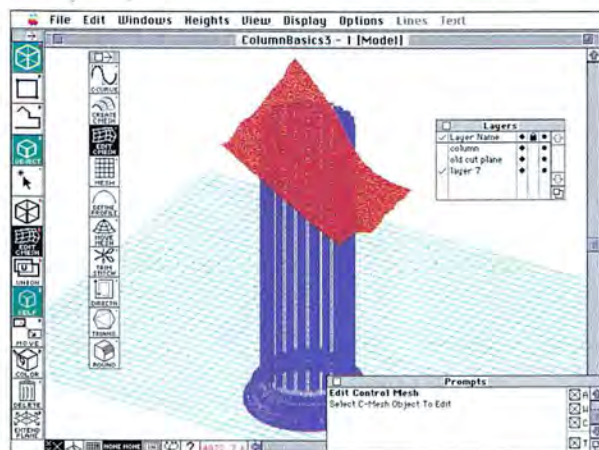
or as easy to use as that of MacroModel or Sketch!, but it's ultimately much more powerful, because it gives you more-precise control over the smoothness of shapes and the coarseness of meshes.

form•Z's meshes — surfaces subdivided into small patches — are useful, because they can adjust easily to conform to curved shapes. To sculpt forms, form•Z lets you move groups of points in a mesh. The effect simulates modeling with clay. When you also use the Random Point Disturbance feature, which randomly applies additional motion to the points in a mesh, you can quickly generate irregular natural-looking objects.

This feature addresses one drawback of 3-D photo-realistic rendered objects — they often look *too* perfect. A modeler that can simulate the imperfections of the real world is unique. In a similar vein, form•Z's beveling and rounding tools provide an easy way to blunt sharp points and round square edges.

Cutting and Slicing

Another strength of form•Z is its ability to apply Boolean operations — union, intersection, and difference — to surface



form•Z is a powerful 3-D modeler that combines surface- and solid-modeling tools for conceptual design. The realistic-looking column shown here was modeled with form•Z (left) and



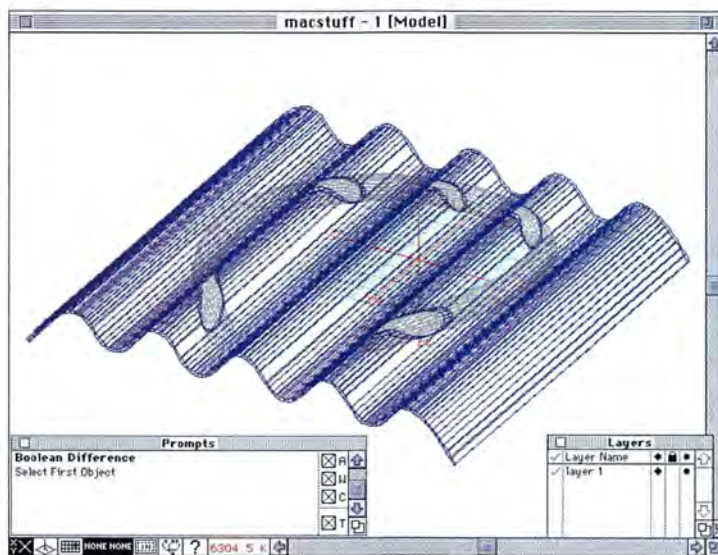
then rendered in the Electric Image Animation System (right). A rough mesh was used to create the broken surface at the top of the pillar.

objects and solids, allowing you to combine simple shapes to create complex forms. For example, you can fuse two objects together or use a cylinder to subtract a hole from an object.

form•Z can also apply Boolean-like operations — trims, splits, and stitches — to spline surfaces. For example, you can trim one surface with another and then stitch the two resulting surfaces together. You can also trim solid objects. In fact, much of form•Z's power resides in its ability to combine surface and solid objects by using Boolean operations and trims.

We used these powerful functions to create a complex, realistic pillar. We began by creating the base from a revolved solid. Using Boolean operations, we then carved flutes into the pillar. Finally, we trimmed the top of the pillar with a rough mesh to create a broken surface. By using a trim instead of a Boolean operation, we were able to isolate the top surface and treat it as an object that was separate from the pillar base. Then, using the Electric Image Animation System, we applied different texture maps to the top surface and the pillar base.

For exchanging files with other programs, form•Z currently supports only the DXF file format for importing and exporting. However, according to autodessys, support for additional file formats — including IGES, RIB, and the Electric Image FACT file — will be available soon. To its credit, form•Z offers one of the cleanest DXF import/export implementations we've ever seen, including excellent support for layers. The program allows an unlimited number of layers and provides a full set of controls for manipulating them. When drawings are exported, form•Z maintains the proper arrangement of layers and their correct colors. This may seem unimportant, but many modeling programs have problems exporting files in non-native formats, and the DXF format is especially troublesome.



By applying such Boolean operations as the Difference command to surfaces and solid objects, you can create a vast variety of complex shapes with form•Z.

As 3-D modelers go, form•Z is not one of the easiest to use. However, once you've determined what tools you need and how you want the program to work, you can tailor form•Z's interface to fit your specifications. Tool palettes are user-definable. In the program's informative, easy-to-use Help dialog box, you can disable any tools and entire palettes you don't use regularly. For the future, another feature we'd like to see is the ability to move individual tools from one palette to another.

No Speed Demon

Its powerful modeling features aside, form•Z is not without problems. Most are speed-related. If you plan to use the program's more-advanced features, we recommend a Quadra-class machine with at least 20 megabytes of RAM. Even then, you'll still find yourself waiting several hours for Boolean and trim operations to finish. For example, the trim operation we used for cutting the top of our pillar required more than 3 hours on a Quadra 950 with 22 megabytes of RAM. Some of the spline surfaces, particularly the NURBS, also take an inordinate amount of time to generate.

Moreover, despite the ability to simplify form•Z's interface to suit their own needs, users may find some operations frustrating. The process of editing spline surface objects, for example, is more difficult than the process used by other programs, although the ability to define the exact number of polygons in a

surface somewhat makes up for this shortcoming. However, surface editing is not intuitive. form•Z takes a modal approach, and it doesn't let you change your view while you're in surface-editing mode. This can be frustrating if you're trying to tweak a surface into a particular shape — you must leave the editing mode if you want a different view of the surface. One last disappointment: form•Z uses inconvenient hardware-based protection.

form•Z's documentation is excellent. The package includes three manuals — one comprising tutorials, another that describes the program's interface elements, and a third that covers modeling concepts and drafting functions.

The Bottom Line

form•Z's versatility and precision make it an excellent tool for a wide variety of conceptual-design applications, including architectural, mechanical, and spline-based modeling. As a stand-alone modeler, form•Z, with its ability to combine solid and surface modeling, is in a class by itself. However, if you require advanced rendering capabilities, form•Z by itself won't fill the bill — it works best as a modeling complement to a dedicated external rendering program.

Overall, form•Z's strengths outweigh its speed deficiencies and steep learning curve. form•Z combines the features, versatility, and power of two or three similarly priced 3-D programs taken together.

— Allen Manning

UTILITIES

SuperATM

By mimicking Type 1 fonts, Adobe's great pretender preserves document formatting.

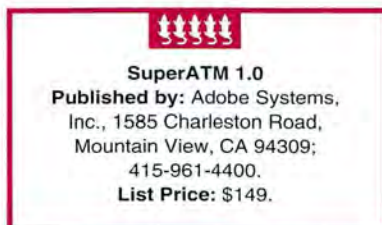
If you use a variety of fonts and regularly swap files with others who do the same, you know what happens when you open a document designed with fonts you don't have in your system. Not a pretty sight. Instead of the aesthetically pleasing original, you see a page of Geneva or Courier with more incorrect line breaks than a compound-fractured tibia. What happens is that your Mac substitutes a bunch of ugly default fonts when it can't find the originals. To combat this visual disaster, Adobe has enhanced its ATM (Adobe Type Manager) font utility to create SuperATM.

Masquerading as Originals

Like its predecessor, SuperATM is an install-and-forget application governed by a control panel. Also like ATM, it automatically smoothes the appearance of text on-screen, making it easy to read and providing users with control over character spacing. It also greatly improves the appearance of characters printed with non-PostScript printers.

The real beauty of SuperATM, however, is its font-substitution feature. Based on Adobe's multiple-master technology, it enables your Mac to detect when a document requires a font the system doesn't have. The utility then creates and displays a metrically correct substitute font that preserves the original document's line and page breaks. You can view, edit, and print the substitute fonts, which SuperATM creates on the fly. Substitute fonts are cleared from memory at shutdown.

But don't think you can rely on SuperATM to handle all of your font needs. True, the utility's substitute fonts do mimic the originals well enough for editing purposes, but they're no substitute for the real thing when it comes to the design process and final



output, so you still need to purchase fonts.

SuperATM has lots of benefits. It saves you disk space if you own numerous fonts but don't want to keep them all loaded just so you can view correctly formatted documents. And if you're in the habit of loading fonts on an as-needed basis, SuperATM saves you the tedious trek through the Suitcase or Master-Juggler dialog box to load the proper ones. You can avoid this step until you need to fine-tune the look of the document or make a final printout.

Although SuperATM's font substitution is extremely helpful, it unfortunately works only with font families from Adobe. If you want to view fonts from other companies, such as Bitstream or

Monotype, you're at the mercy of ugly default fonts once again.

Additionally, SuperATM's on-the-fly font substitution doesn't yet work with all applications. As we went to press, 21 applications — including QuarkXPress 3.1, Aldus PageMaker, Microsoft Word and Excel, and ClarisWorks — provided support for SuperATM. If your application doesn't support ATM, you can manually create substitute fonts by installing bit-mapped versions of fonts, but we found this workaround somewhat clumsy.

SuperATM is bundled with Adobe Type Reunion 1.1, which conveniently groups fonts into families on pop-up and pull-down menus. Type Reunion helps you keep track of font substitution by placing a black diamond next to the names of any SuperATM-created substitute fonts on the font menu.

The SuperATM package also includes Adobe's Type On Call CD-ROM, which contains the complete Adobe Type Library, with 1,500+ fonts. Bit-mapped versions of all the fonts are on-disc and freely available, but if you want outline versions of the fonts, you must purchase them separately from Adobe.

SuperATM requires at least a Mac SE with 4 megabytes of RAM under System 7 or 2 megabytes of RAM under System 6. You also need at least 4 megabytes of hard-disk space to store the program and to allow for substitute-font storage.

The Bottom Line

ATM was a huge leap forward for graphics professionals and mainstream users alike. SuperATM may not be as revolutionary, but once you've used its font substitution to view correctly formatted documents, you'll wonder how you ever got along without it.

— Shelley Cryan

ACCURATE
ACCURATE
Accurate

SuperATM can create substitute fonts (middle line) so metrically similar to the originals (top line) that they preserve document line and page breaks. The top line shows the original caps-only Adobe Juniper font. The bottom line shows the default font that's used when Juniper or SuperATM is not installed.

Ascend

Franklin Quest puts a New Age spin on PIM software.


Ascend is not your usual personal information manager. Created by Franklin Quest, a time-management-training organization, Ascend is billed not only as a personal information manager but also as a system that can help you take control of your life. As advertised, Ascend is indeed in harmony with Franklin Quest's time-management techniques, although the overall effect of the program's confusing proliferation of modules is decidedly jarring.

Module Mania

As with most PIMs, Ascend's focus is on helping you keep track of names, addresses, phone numbers, appointments, and to-do items. The program combines these traditional PIM features with self-motivation aids, linking it to Franklin Quest's Life Management system of "empowering" software, books, tapes, seminars, and the Franklin Day Planner System. In the end, Ascend comes off more as a philosophy than as a software program.

This in itself is not negative, particularly if you buy into Franklin's time-management system. However, the key to the success of most PIMs is simplicity, and it's here that Ascend goes seriously astray. The program provides no fewer than 11 modules to help you manage your time and personal information, including Address and Phone, Appointment Schedule, Daily Task List, and Master Task List.

To begin, Ascend emphasizes the importance of defining personal values and goals, which you then use to create a master plan. So you define a governing value — a principle you strongly believe in — and then you set long-range goals, intermediate goals, and daily tasks, all of which are designed to help reinforce the value for your total well-being. A governing value might be "I am a good



Ascend 3.0
Published by: Franklin Quest
 Co., 2550 S. Decker Lake Blvd.,
 Suite 26, Salt Lake City, UT
 84119; 801-975-9992.
List Price: \$199.

provider for my family." A long-range goal might be "to send my children to college." You might break this down into intermediate tasks ("put enough money aside") and daily tasks ("put \$5 into the For College jar") to help you step your way toward the long-term goal.

As you enter daily tasks into the Personal Values and Goals module, they automatically show up in your to-do list. You can set priorities for each to-do item, add descriptive notes to them, categorize them, and set the task code (Completed, In Process, Planned Forward, and so on). A similar module, called the Master Task List, includes to-do items that aren't connected with specific dates.

Ascend's Appointment Schedule module is poorly designed. You enter events at the appropriate day-and-time slot and then enter the event duration according to the number of 15-minute time blocks

the event occupies. For example, if you have a meeting from 3:00 to 5:15, you must calculate that it requires nine time blocks. Unlike most other calendar programs, Ascend does not allow you to enter beginning and end times for events, nor can you click and drag a time line. Ascend lets you set up recurring events, but it doesn't provide enough options to make the feature truly useful. As part of its scheduling module, Ascend offers an alarms feature, but because an alarms extension isn't provided, the program must be running for this feature to work.

Ascend provides a modest Address and Phone module with fields for name, address, company, title, and as many as five phone numbers (automatic dialing is included). A free-form notes field with time and date stamps helps you keep contact logs.

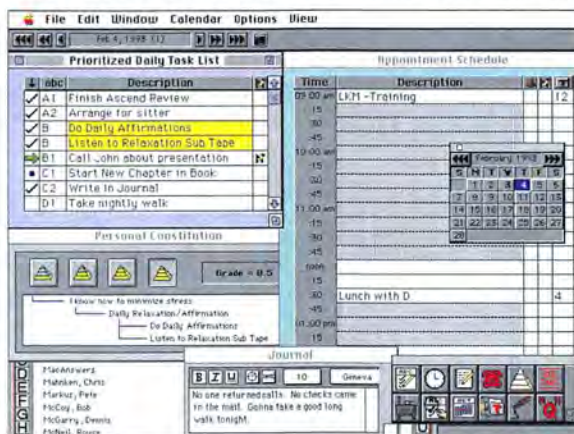
In addition to contact-specific notes, Ascend lets you keep a daily record of business events and a personal daily journal. You can index events in the daily record to create a monthly report. In case your note-making needs still remain unmet, the Red Tabs module lets you list miscellaneous ideas and notes.

The Turbo File and Favorite Quotes modules round out the program. Both are minidatabases that let you store tidbits of information and motivational quotes, respectively. Each offers keyword indexing and user-customizable categories.

The Bottom Line

Franklin Quest gets an A for effort for attempting to combine a wide variety of information-organizing features into one PIM program. Unfortunately, it doesn't get high marks for implementation. Ascend's many modules are not only confusing but they can even be downright intimidating. We can't recommend Ascend.

— Tom Petaccia



A productivity enhancer and a "life management" system, Ascend boasts 11 personal-information-storage modules we found more confusing than helpful.

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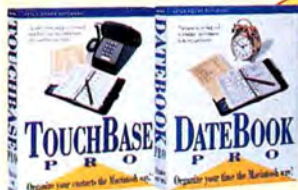


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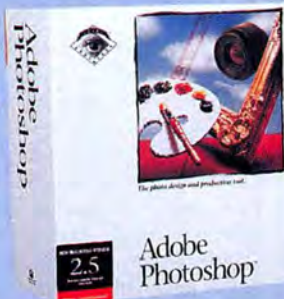
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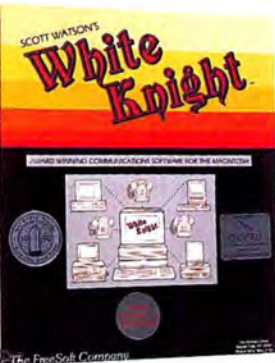
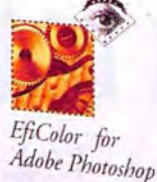
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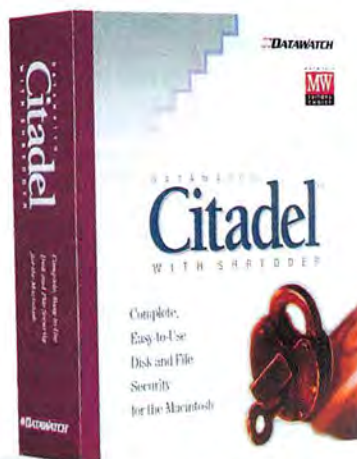
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However, we discovered that despite its scaled-down functionality, FASTAT offers no real ease-of-use advantages to inexperienced statisticians — it turns out to be every bit as difficult to use as SYSTAT.

Family Resemblance

Although FASTAT and SYSTAT have many of the same menu commands and dialog boxes in common, FASTAT doesn't provide the full range of statistical procedures and graph types that SYSTAT does. Still, FASTAT is no lightweight — the program provides a healthy assortment of statistical tools and graph types, including factor analyses, time-series analyses, regression analyses, factorial ANOVA, scatterplot matrices, 3-D spin plots, probability plots, and function plots.

Both FASTAT and SYSTAT have been substantially improved since their initial releases. The first versions of both programs clearly demonstrated that they were derived from a batch-oriented command-line-based ancestor. The only concession to the graphical environment of the Mac was a surrounding shell comprising a few simple menu commands.

With this new version of FASTAT, however, menu commands and dialog boxes have almost completely replaced the command-line interface. FASTAT's data editor uses a familiar


FASTAT 2.0
Published by: Systat, Inc., 1800
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 60201; (708) 864-5670.
List Price: \$495.

spreadsheetlike format. You can move, copy, paste, and edit data sets just as you do in a worksheet. In addition, the company has added a palette of plot tools that lets you enhance graphs.

Exploratory Tools

One of FASTAT 2.0's best new features is its selection of tools for identifying specific points on scatterplot graphs. When you click on a point in a graph, FASTAT highlights the corresponding record in the data editor, which makes it easy to isolate points for further analysis. Similarly, when viewing the results of an analysis, you can Option-click on any variable to bring up a pop-up menu that lists related graphs and statistics for that variable. With the addition of this feature, FASTAT becomes more

versatile — it can serve not only as a traditional hypothesis-testing tool but also as an exploratory-analysis tool.

For those of you who frequently work with data comprising many variables, FASTAT's Define Bundles command is another plus. By letting you define any variable subset as a bundle, it eliminates the need to scroll through all variable names to find the ones you want. When you select the bundle, only its variables appear in the variable-selection list. You can define as many as five bundles and shift among them by clicking on the bundle icon.

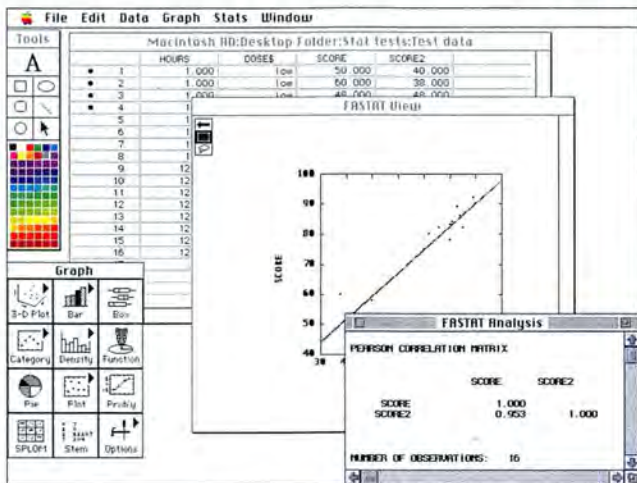
Despite these improvements, FASTAT is still cumbersome. For example, sorting and recoding variables often require you to save the converted data to a separate file. To make matters worse, you can't have more than one file open at a time.

No Hot Links

When FASTAT completes an analysis, it places the results in a window. But the window is not hot-linked to the data editor, so you must run a new analysis each time you make a change in the data set. This makes it difficult to compare the effects of adding or deleting data elements. Similarly, to make even a minor modification to a graph (such as adding a best-fitting regression line to a scatterplot), you must recreate the entire analysis from scratch.

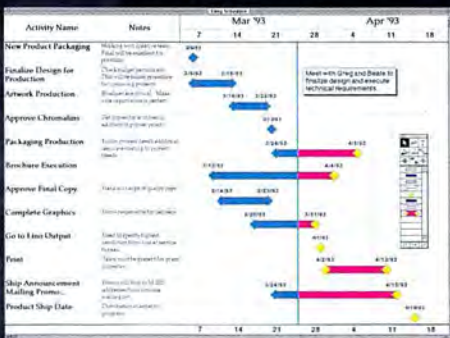
Equally irritating, the results of ANOVA analyses completely disappeared when we requested related supplementary analyses. This forced us to redo the initial ANOVA analysis each time we wanted to try an additional supplementary analysis.

If you make a mistake,

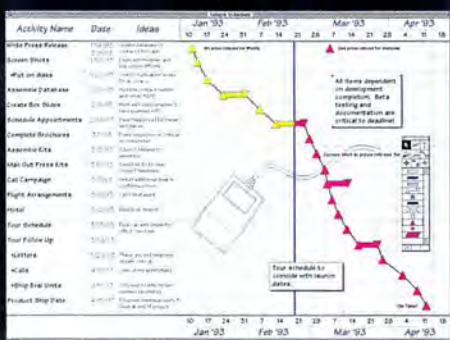


The FASTAT statistics program can be cumbersome to use, and the quality of its graphs is somewhat lackluster. Fortunately, the new Tools palette (top left) lets you spruce up graphs with colorful enhancements.

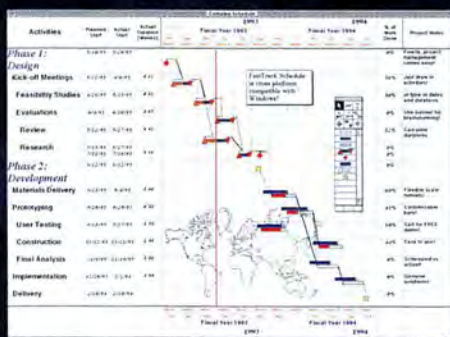
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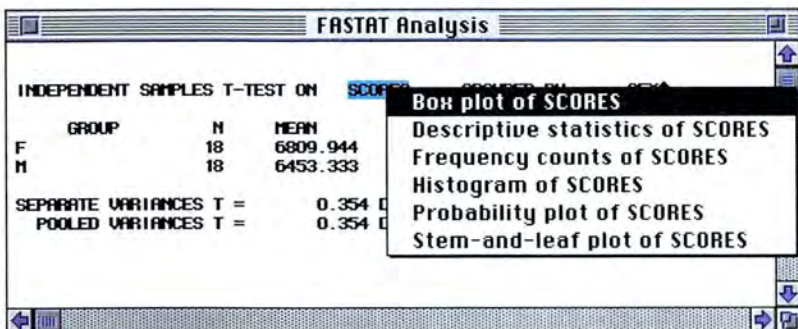
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NEW ON THE MENU REVIEWS



The latest version of FASTAT supports exploratory data analysis. When you Option-click on any variable in the FASTAT Analysis window, FASTAT presents a pop-up menu with additional options.

that's just too bad — FASTAT's Undo command is rarely active when you need it most. FASTAT does provide extensive context-sensitive on-line help, however, including a general Help window; an Information window, which provides in-context definitions of terms; a Balloon Help-like feature that explains each menu command; and mini help messages in every dialog box.

Unfortunately, FASTAT's manual is not as impressive as the on-line help. For those who are already familiar with statistical procedures, the manual is adequate. But for those users who require a tutorial to help them learn unfamiliar procedures, it falls far short. Here's an example: Although the manual instructs you to select the MGLH (multivariate general linear hypothesis) option to access FASTAT's regression and ANOVA commands, it never explains MGLH. Ironically, the SYSTAT manual devotes an entire chapter to the meaning of this term.

Also, if you want to add a legend to a graph, you must first select the Symbol dialog box and assign separate symbols to each variable. The manual makes no mention of this requirement. Furthermore, the Symbol dialog box requires you to enter numbers that correspond to the symbols — you can't simply click on the symbols themselves.

Another weakness is in the area of graphing. Although the FASTAT package promotes the program's "presentation-quality graphics," we found the quality not to be on a par with that of other statistical packages in FASTAT's price range.

In order to get data into FASTAT, you can either enter it directly into a data-editor worksheet, import it as a text file, or import it from Excel.

The Bottom Line

The latest release of FASTAT is a big improvement over the previous version. Its interface is significantly enhanced, although there's still more work to be done before FASTAT fully exploits the Mac's graphical abilities. Improvements aside, FASTAT remains difficult to use.

FASTAT 2.0 provides basic statistical procedures and graphing options and several more-advanced techniques at half the price of its more powerful sibling, SYSTAT. Still, in our view, it would be a better strategy for the company to offer a single midrange program, such as FASTAT, and make more-advanced features available as separate, optional plug-in modules. As it is now, FASTAT users who need more-advanced features must lay out an additional \$400 to upgrade to SYSTAT, which duplicates many of the features they already have in FASTAT.

Compared with other midrange statistical programs for the Mac, FASTAT has an interface that puts it at a significant disadvantage. StatView, for example, has a well-designed interface and statistical power that's comparable to FASTAT's. And Data Desk and JMP are better choices than FASTAT if your main requirement is exploratory data analysis.

If your statistical demands are relatively light, a spreadsheet program may be all you need. Excel 4.0, in particular, has beefed up its statistical-analysis power by providing ANOVA and regression tools. By and large, spreadsheet programs offer more-flexible data entry features and more-attractive graphs than statistics programs do.

SYSTAT, however, remains the first choice for those who need the most complete range of sophisticated statistical-analysis procedures and graph types.

— Ted Landau

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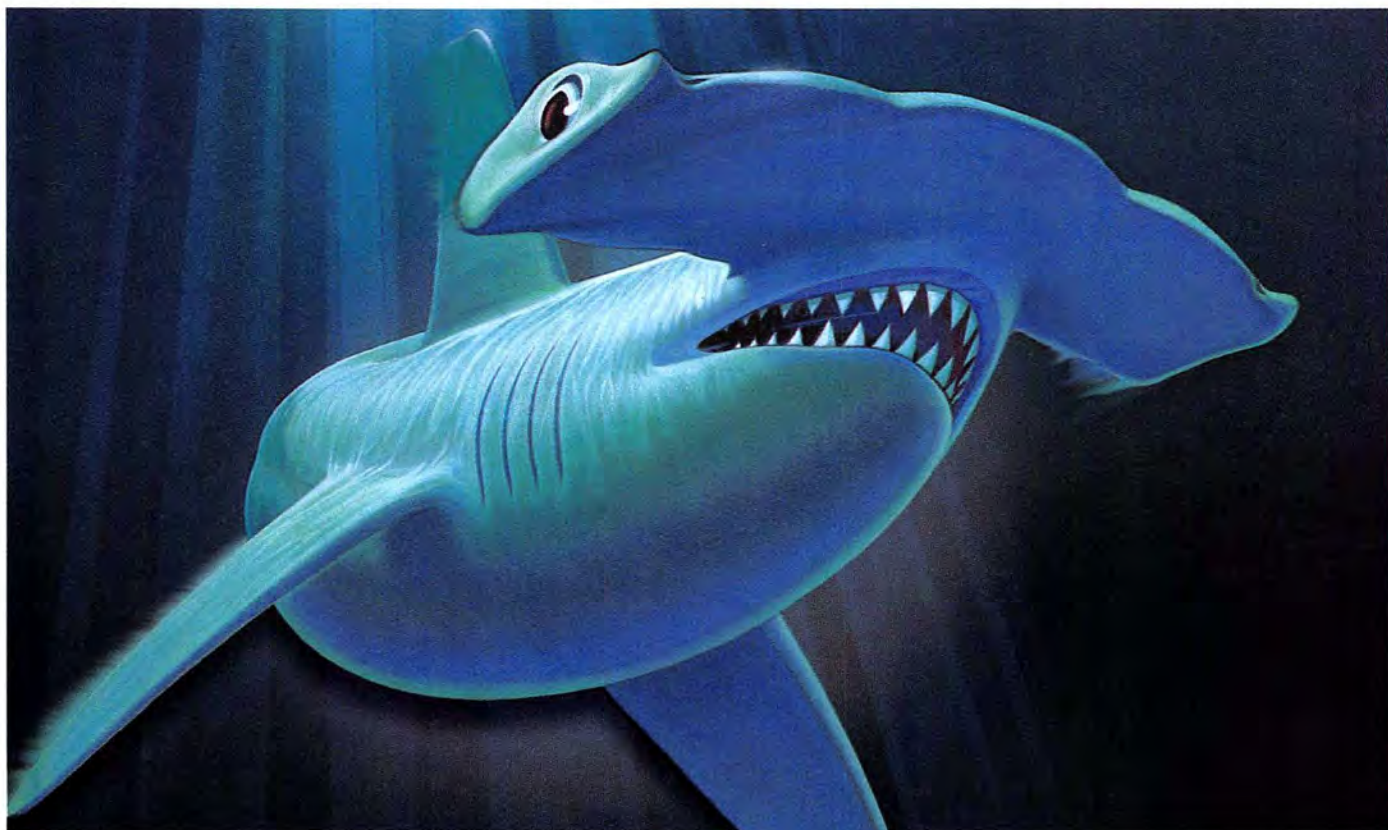
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OUTPUT DEVICES

Apple StyleWriter II

Boasting gray-scale output and improved speed, the Apple StyleWriter II jockeys for position with the HP DeskWriter.

Comparing Apple's new StyleWriter with its predecessor is a no-brainer — *faster, cheaper, and better* sum it up. But how well does the StyleWriter II stack up against its real competition — the similarly priced HP DeskWriter? Our tests show that the StyleWriter II has no trouble besting the DeskWriter in text-output quality but that it falls far behind the HP printer when it comes to printing speed and gray-scale-output quality.

Printing with Style

The \$359 StyleWriter II is a 360-dpi thermal inkjet printer that connects directly to the Mac's printer port. Its compact design is similar to the original StyleWriter's, although its speed, ability to print graphics, and paper handling are much improved. At 2 pages per minute, it's no speed demon, but it's about twice as fast as its predecessor and handles about 100 sheets of standard paper and as many as 15 envelopes, double the original printer's capacity.

The slim, trim printer measures about 13 inches long, 11 inches wide with the paper catcher extended, and 7 inches high (not counting the paper tray's 10-inch tongue). Its improved design makes it slightly bigger than its predecessor, but it offers the advantage of coming in one piece with an internal power supply. The original StyleWriter used an inconvenient power brick and came in two large pieces that snapped together. In addition, the StyleWriter II's print head is positioned closer to the paper, so it produces more accurate dot placement.

The most significant new StyleWriter II enhancement, however, is its GrayShare software. GrayShare adds two important functions: It allows the device to print true-gray-scale images (the old StyleWriter could produce only crude black-



Apple StyleWriter II
Manufactured by: Apple
 Computer, Inc., 20525 Mariani
 Avenue, Cupertino, CA 95014;
 408-996-1010.
List Price: \$359.

and-white graphics, because of the inadequacies of the original printer driver), and it lets users share a StyleWriter II on a LocalTalk network. The StyleWriter II doesn't connect directly to the network — it's shared through a host Mac. Users on the network select the printer from the Chooser, and the GrayShare software sends the print job to the host Mac.

To connect the StyleWriter II to your Mac, you need System 6.0.7 or later and a hard drive. An installer program installs the printer software and several TrueType fonts, making setup relatively painless. If you plan to share the printer with other Macs on a LocalTalk network, each networked Mac, in addition to the host Mac, must have the StyleWriter II software installed. Apple's license lets you install the printer driver on

as many Macs as you want, but you can't install the TrueType fonts that come with the StyleWriter II on more than one Mac. StyleWriter II ink cartridges list for \$19 apiece and should be adequate for approximately 500 pages. They contain water-based ink, so you have to protect printed output from moisture to prevent ink bleed.

We performed several tests to see how the StyleWriter II's print performance and quality compared with the DeskWriter's. We first tested the printers with a direct connection to a host Mac IIci with 8 megabytes of RAM, running System 7.0.1. Then we tested the StyleWriter II's GrayShare printer-sharing abilities by networking a Mac Classic II with 5 megabytes of RAM to the Mac IIci host with LocalTalk (the DeskWriter was left out of this test, because it doesn't support printer sharing). Our test files were a ten-page Word document and a gray-scale TIFF image. We printed the two files, using the highest-quality settings on both printers.

When directly connected to the host Mac, the two printers processed the ten-page text file in roughly the same time: 5 minutes, 32 seconds for the StyleWriter II, compared with 5 minutes, 50 seconds for the DeskWriter. The StyleWriter II printed the same file in 6 minutes, 19 seconds as a shared printer on the network. As for print quality, the StyleWriter II was the hands-down text-output winner — the characters were crisp and clean, whereas the output from the DeskWriter was somewhat muddy by comparison.

The tables were turned, however, for gray-scale-image quality. Here, the DeskWriter came out on top. Although the StyleWriter II's GrayShare technology had no trouble improving on the original StyleWriter's output, it couldn't



Apple's low-cost StyleWriter II is a big improvement over the original StyleWriter. The 360-dpi thermal inkjet printer features GrayShare, software that allows it to produce gray-scale graphics and to be shared on a network.

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VIEW ON THE MENU REVIEWS

edge of a cliff



edge of a cliff



Compared with output from the HP DeskWriter (top right and bottom right), StyleWriter II text output (top left) is better but the quality of the Apple printer's gray-scale images (bottom left) can't match the DeskWriter's.

match the DeskWriter's gray-scale output, which was consistently cleaner and more detailed than the StyleWriter's. The DeskWriter's speed for printing gray-scale images was much faster than the StyleWriter II's — the DeskWriter took 7 minutes, 17 seconds to print the same image that took 13 minutes, 17 seconds with the StyleWriter II.

When we shared the StyleWriter II over the network, the gray-scale image took 38 minutes, 27 seconds to print. The impact on the host Mac's performance was noticeably disruptive. We often had to wait 10 to 20 seconds for menus to pull down or for keyboard input to catch up with our keystrokes. Overall, given the StyleWriter II's poor showing in our graphics-file speed tests, we found that sharing a StyleWriter II over a network can seriously hamper your productivity.

Printing text files to the StyleWriter II over the network had relatively little effect on the host Mac. You may encounter a second or two of delay in your keystrokes as each new page of a print job starts, but we found the effect much less noticeable than printing in the background to a laser printer.

If you purchased an original StyleWriter, you'll be pleased to know that you can use the improved StyleWriter II software to enhance your printer's output. Contact your Apple dealer for details.

The Bottom Line

The StyleWriter II is a vast improvement over its predecessor. The most notable advancement is the printer's new software, which allows the StyleWriter II to produce true-gray-scale images as well as to be shared on a network. When judged against its chief rival in the low-end-printer race — the HP DeskWriter — the StyleWriter II is a good choice if you want to print text only but doesn't stack up well for gray-scale printing. And although it's true that at a list price of \$359, the StyleWriter II is less expensive than the \$599 DeskWriter, when you consider the heavily discounted street price of the HP printer, the StyleWriter loses much of its price advantage. Apple has taken the next logical step with its lowest-cost printer, but we feel that it lags several steps behind the competition for gray-scale printing.

— Gregory Wasson

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UTILITIES

DiskDoublor and StuffIt Deluxe

StuffIt Deluxe bests DiskDoublor as the most versatile file-compression utility around.

The data-compression world is in a constant state of flux, and it's sometimes hard to tell the players without a scorecard. Two veterans have recently reentered the fray, boasting new features aimed at making them more competitive. Fifth Generation's DiskDoublor and Aladdin's StuffIt Deluxe both specialize in manual file compression, but with its myriad of options and features, StuffIt Deluxe easily outdistances DiskDoublor.

DiskDoublor

The \$79.95 DiskDoublor utility installs as a system extension and adds a menu of compression commands to the Finder. Other items installed are the DiskDoublor application (for use when the extension is turned off), a utility for repairing corrupted files, and an expand-only freeware application you can distribute to others so they can expand the compressed files you give them.

DiskDoublor's main features haven't changed much over the years. To compress a file, you simply select it and click on the DD menu's Compress command. The compressed file quickly appears in place of the original. The Expand command (you guessed it) decompresses a file. When you select a folder, DiskDoublor can either compress or decompress all the enclosed files. The program's Combine command lets you combine multiple files and folders into a single compressed archive, just as you would with StuffIt. However, unlike StuffIt, DiskDoublor doesn't let you select specific files and folders in an archive for decompression. You can decompress only whole archives — a real disadvantage.

New additions to the DD menu include commands that let you compress and expand files, as well as copy already-compressed files, to a specific location on your disk. The Create



DiskDoublor 3.7.7

Published by: Fifth Generation Systems, Inc., 10049 N. Reiger Road, Baton Rouge, LA 70809; 504-291-7221.
List Price: \$79.95.



StuffIt Deluxe 3.0.4

Published by: Aladdin Systems, Inc., 165 Westridge Drive, Watsonville, CA 95076; 408-761-6200.
List Price: \$120.

SEA command compresses a file as an application, which means that the file doesn't rely on the presence of DiskDoublor. The file self-decompresses when you double-click on it. Once decompressed, a file appears in its application's standard Open and Save dialog boxes. DiskDoublor can optionally re-compress a file automatically when you close the document.

DiskDoublor's compression methods are compatible with those of Fifth Generation's AutoDoublor, a background compression utility that compresses files automatically.

StuffIt Deluxe

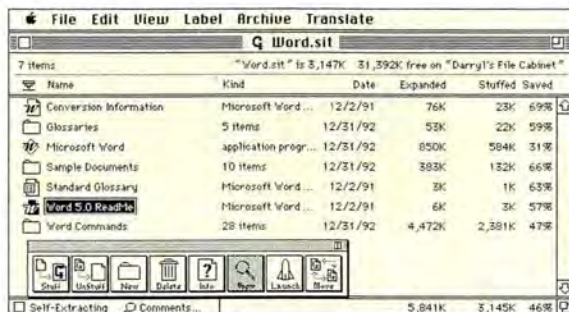
With the latest version of the StuffIt Deluxe utility, Aladdin has added two control panels — SpaceSaver and Magic Menu — to its \$120 package. SpaceSaver provides optional automatic background compression, and Magic Menu installs a menu of compression commands in the Finder.

SpaceSaver can respond to keywords that you specify and add to filenames. When you add a keyword to a filename, SpaceSaver knows to compress the file. When you delete the keyword, SpaceSaver knows to decompress the file. If you're running System 7, you can set SpaceSaver to automatically compress all the files that have a specific Finder label.

StuffIt Deluxe is an archiving utility, which means that it can combine two or more files into a single file for compression. StuffIt lets you view the contents of an archive in a window and displays as many as eight archive windows simultaneously, so you can drag files and folders among windows to move or copy them. In addition, StuffIt optionally encrypts and password-protects archives. It also supports a wide variety of file-compression formats, including several DOS and UNIX formats.

Compared with SpaceSaver's automatic compression method, StuffIt's conventional method squeezes files much tighter. But the trade-off is that smaller files require more compression time. StuffIt's Magic Menu provides two commands for maximum compression — Stuff and Make Self-Extracting. To make a self-extracting file, StuffIt adds about 21K to the file size.

StuffIt Deluxe also provides a custom scripting language for automating repetitive archiving procedures, and it comes with QuickKeys extensions to let you



StuffIt Deluxe 3.0.4 displays the contents of archives in windows. The program's floating control palette provides easy access to compression operations.

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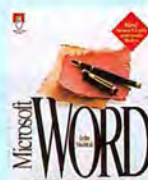
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DiskDoubler provides basic manual file-compression options. A single dialog box presents most of its controls.

stuff or unstuff files by using a single keystroke.

StuffIt Deluxe is System 7-savvy, which means that other applications can control StuffIt functions with Apple events. One other especially useful aspect of using StuffIt under System 7 is that you can stuff and unstuff files simply by dragging and dropping their icons into the StuffIt Drop Box, in the Finder.

One caveat — you pay a price in complexity and disk space for StuffIt's rich feature set. The StuffIt folder is 1 megabyte in size and contains six folders of support files in addition to the application itself. The StuffIt Engine, the StuffIt Deluxe Extension, the SpaceSaver and Magic Menu control panels, and the Aladdin folder occupy another megabyte in your System Folder. That means you won't achieve any net increase in disk space until you have reclaimed more than 2 megabytes of space through compression. By comparison, all of DiskDoubler's files occupy only 466K.

The Bottom Line

With the addition of the SpaceSaver background-compression control panel, StuffIt Deluxe 3.0.4 provides the most versatile and full-featured compression software you can find. For \$120, you get both manual and automatic background compression plus password protection, archive encryption, file translators, a scripting language, Apple-events support, QuickKeys extensions, and support for drag-and-drop compression.

The \$79.95 DiskDoubler, on the other hand, is simpler to use than StuffIt, because it provides fewer options. And it can save you a few dollars (and some disk space) over StuffIt if you're sure you'll never need more than straight manual compression.

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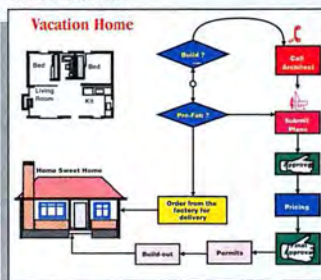


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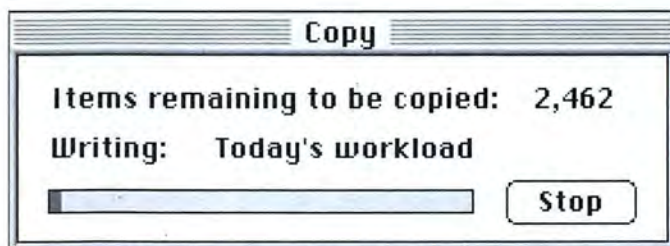
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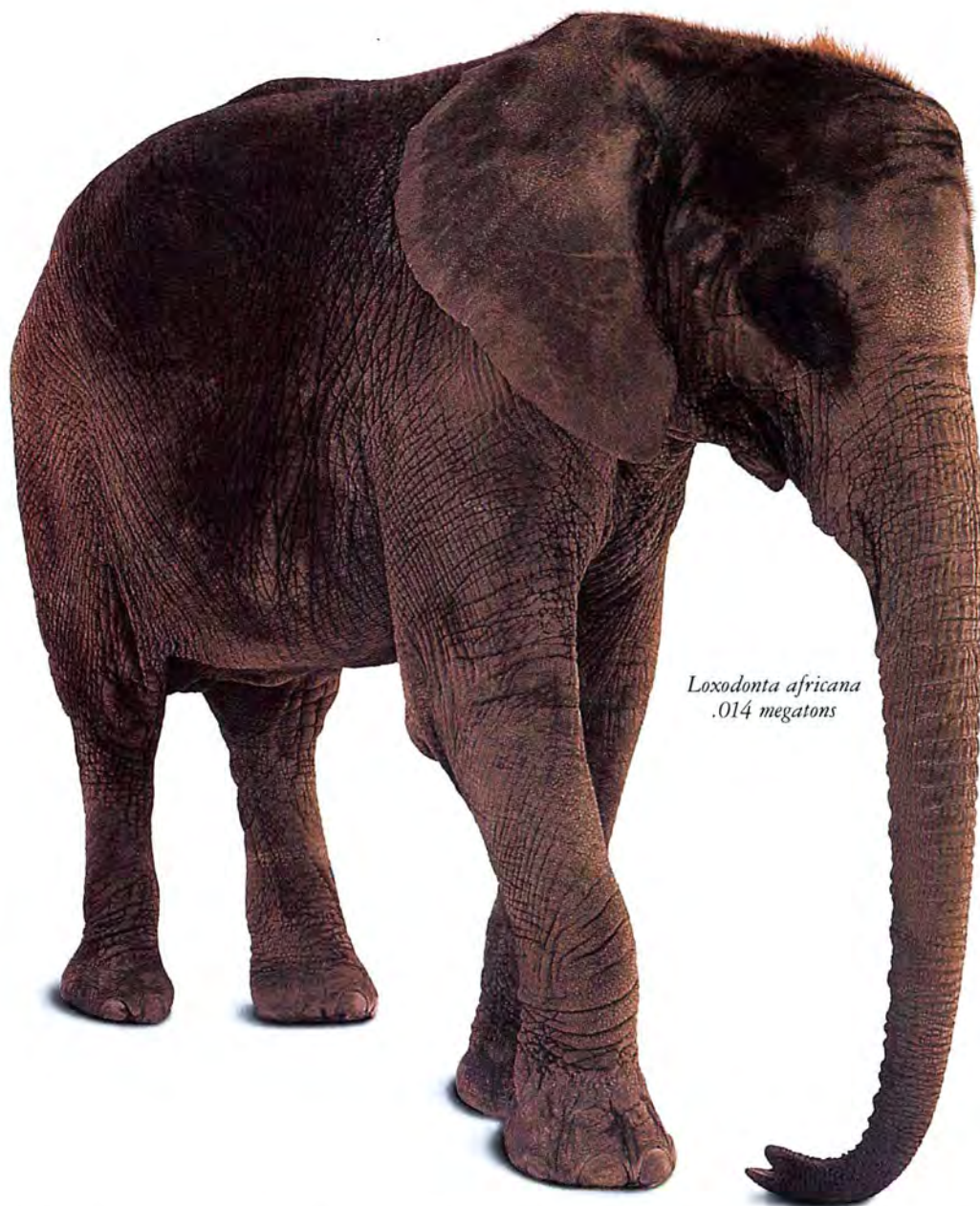
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QUICK CLICKS



The Madness of Roland

★★★★½

If you think hypermedia is all hype and no substance, you haven't experienced *The Madness of Roland*, a CD-ROM billed as "the world's first interactive multimedia novel."

The Madness of Roland is a tale of passion, adventure, and intrigue presented in a sort of on-screen illuminated manuscript (in color or black-and-white) with hypertext and multimedia elements. Based on medieval legend, it tells the story of Roland, a knight in the service of the Emperor Charlemagne.

Each chapter opening presents you with a set of tarotlike icons that represent the available points of view, including those of Roland; Charlemagne; the enchantress Angelica; Roland's magic sword Durendal; and Beji, a spy for Charlemagne's Saracen enemies, who are fighting to regain possession of Durendal. Clicking on an icon opens the sequence of pages that correspond to the viewpoint you've chosen and begins the optional sound track, in which music plays and actors read the characters' parts. Each page is edged with icons that link you to an assortment of treasures: other characters' points of view; the sun layer, which has relevant quotations (for which sources range from Jung to a medieval cookbook to *How to Make Love to a Woman*); the moon layer, with poetic animated sequences; and tools such as bookmarks, the Find function, and a map.

The Madness of Roland uses layering and multimedia not for their own sake but to create a complex, adult work of fiction. The main characters' distinct points of view provide sometimes-contradictory accounts, so the order in which you view them can be meaningful — for example, Roland's initial triumph over the Saracens may seem more heroic if you haven't yet heard Charlemagne disputing Roland's account of the location and characterizing him as "not very bright." When you reach Roland's descent into madness, you may revisit the different points of view to try to unravel what happened or you may just shiver at the QuickTime sequence that plunges you into the dark forest of Roland's unhinging.

Our encounter with the program was

not without glitches. We had to turn off some extensions to get it to load, and some of the boldface words we clicked on in the text popped up blank messages instead of the clever asides and explanations we found elsewhere.

Nonetheless, such annoyances were greatly outweighed by our pleasure in exploring this multidimensional, groundbreaking work.

HyperBolt Studios, 1412 W. Alabama, Houston, TX 77006; 713-529-9696. Version Book 1. \$59.95.

— Karen J. Ohlson



Safe & Sound

★★★★

Imagine being able to hand your misbehaving disk drive to an expert and say, "I don't know if there's anything wrong with this, but if there is, just fix it — I don't want the gory details." Well, now there *is* such an expert: *Safe & Sound*, from Central Point Software.

Pop in the *Safe & Sound* disk, and start your Mac; 5 to 15 minutes later (depending on the disk's size), your disk will have a clean bill of health. You won't get any esoteric dialog boxes identifying a problem and asking if you'd like it fixed. Instead, you'll get a dialog box telling you that *Safe & Sound* encountered some problems and took care of them.

Safe & Sound looks for the 100 most common disk problems. It scans your disk for bad blocks and looks for viruses and multiple System Folders. It checks files for bad dates and incorrectly set bundle bits (which can make files lose their icons). And it makes an Undo file of all the problems and fixes so you can return the disk to its previous, problematic state.

Although *Safe & Sound* is meant to work without troubling you with decisions, you can turn many of its options on or off, choosing whether the program should scan for viruses or report on file fragmentation, for instance.

Safe & Sound works flawlessly, but its documentation is a little too light for a product meant for rank beginners. The documentation never mentions, for instance, that you should run the program as preventive medicine and not just use it for problems that are already rearing their ugly heads. Nor does it mention that you can run the program from your hard disk instead of from the slower startup floppy disk. And when you run *Safe & Sound*

from the floppy disk, the program never remembers the options you set — because *Safe & Sound* can't write changes to the locked floppy disk.

Still, *Safe & Sound* is perfect for non-technical users who might shy away from *MacTools*, Central Point's highly praised disk-utilities package. In fact, *Safe & Sound* is the Disk Fix portion of *MacTools* with a friendlier interface. Can't decide which you should get? *Safe & Sound* is \$50, and you can upgrade to *MacTools* for about \$50; *MacTools* alone is about \$150. You figure it out.

Central Point Software, 15220 N.W. Greenbrier Parkway, Suite 200, Beaverton, OR 97006; 503-690-8090. Version 1.0. \$50.

— Sharon Zardetto Aker



Color It!

★★★★½

If you want a reasonably priced paint program that also lets you jazz up clip art, scanned-in photos, and other imported images, check out *Color It!* 2.0.1. Welcome enhancements to the program include some handy new tools, a redesigned tool palette, a plethora of added filters, support for pressure-sensitive tablets, and the ability to colorize gray-scale images. However, set aside plenty of time to learn these new features, because the poorly written tutorial and manual aren't much help.

The new scissors and zap tools make the program's much-touted magic-wand tool even more useful. The magic-wand tool, as in earlier versions, lets you easily select image areas that have the same intensity level. But now when the magic wand grabs more than you'd like it to, you can use the scissors tool to mark off unwanted areas and the zap tool to remove those areas from the selection range.

To colorize your gray-scale images, you specify that you want anywhere from 256 to millions of color levels and then use *Color It!*'s rich assortment of paint tools to apply colors. Customizable settings for opacity, brush size, and anti-aliasing (for rounding out rough edges) are particularly handy. If you don't like your changes, use the 15 levels of Undo to backtrack.

Forty new image-processing filters and the ability to add custom filters are features that could profit from better explanations in the manual. Fortunately, *Color*

It's preview feature helps you figure out through trial and error which filter to use. You'll find filters that enhance edges or gray levels or blur, sharpen, or despeckle. For additional effects, you can use most Photoshop-compatible plug-in filters with Color It! If your final output will be on a television, you can optimize your image quality with the program's NTSC Video Safe filter.

Although Color It! isn't all that easy to use, it provides a lot of value with its many new features — by the time you read this, you'll even be able to get an add-on color-separation utility, called Color It! PrePress, as a \$49.95 upgrade. And with Timeworks bundling Color It! with Publish It! Easy, for \$199.95 through June 30, it's a great bargain for entry-level and midlevel desktop publishers.

Timeworks, 625 Academy Drive, Northbrook, IL 60062; 800-323-7744 or 708-559-1300. Version 2.0.1. \$299.95 for disk or CD (CD contains 400 extra sample image files).

— Shelley Cryan



A-Train



The great unwashed, at first glance, might mistake A-Train for SimCity II. After all, both simulations focus on the successful development of a large city featuring residential, commercial, industrial, and recreational properties. But where SimCity places you in the position of a benevolent urban planner nurturing an uncongested utopia, A-Train asks you to become a financial mogul bent on the profitable and unregulated development of the surrounding countryside.

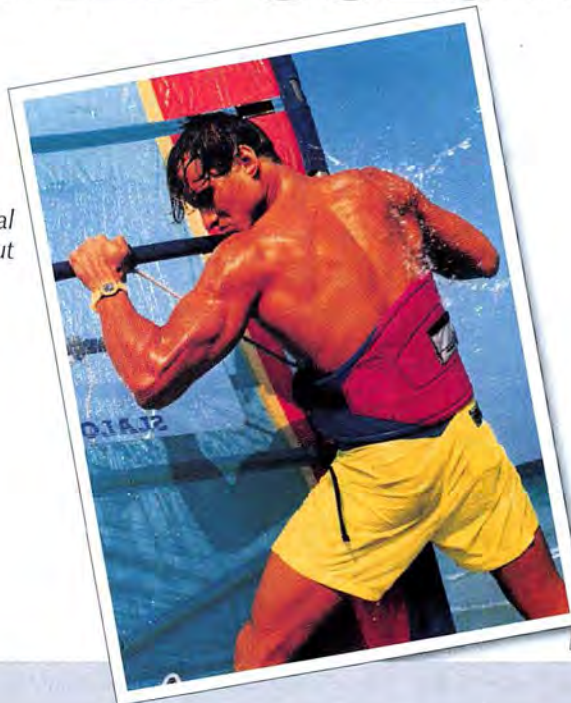
You open A-Train to a bird's-eye view of a landscape with chugging trains hauling in building materials from an off-screen metropolis. Depending on the scenario you've chosen — A-Train includes six, ranging from the pastoral and easy New Town to the difficult Multi-City Connection — your trains wend their way through meadows and mountain ranges or between towering skyscrapers.

To earn enough lucre to win the simulation game, you must first don your engineer's cap and design a viable railway system that delivers building materials and — once you've built things up — people to your burg. Then you become more involved in financial matters: You learn to route and schedule rail traffic, take on bank loans, play the stock market, and buy and sell properties. Although A-Train's manual is up to Maxis' high standards, consulting Nick Dargahi's *A-Train: The Official Strategy Guide* (Rocklin, CA: Prima Publishing, 1993) will turn you more quickly into the next Leland Stanford, Jr.

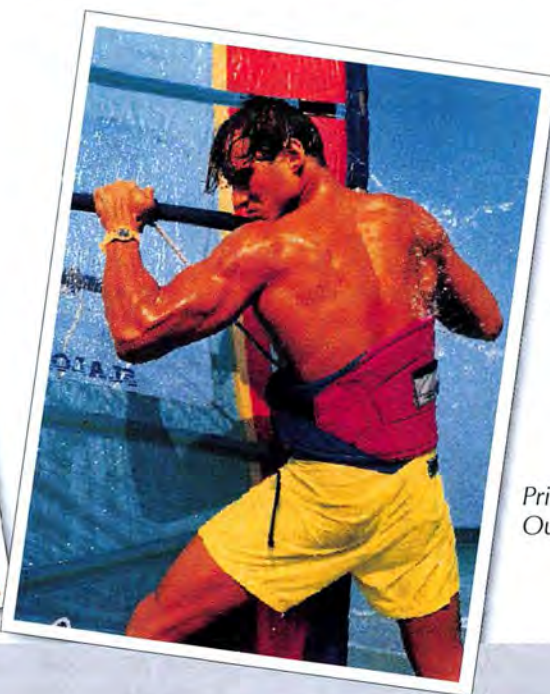
A-Train is a complex simulation with some nice touches. Tables and graphs detail the success or failure of your railroad, properties, and investments. Players can watch their town change from day to night and season to season (look for Santa's appearance on December 24!). Unfortunately, you pay for these goodies with a slowdown (even on a IIcx with a 40-megahertz accelerator) that suggests

WHEN COLOR CONSISTENCY

Original
Input



Printer
Output



you're riding on the Zzzz-Train. Once A-Train gets up steam, though, you should find enough challenges to entertain you all the livelong day.

Maxis, 2 Theatre Square, Suite 230, Orinda, CA 94563; 800-336-2947 or 510-254-9700. Version 1.0. \$69.95; A-Train Construction Set, \$34.95.

— Christopher Breen



L-TV



Ever wondered why you can't use a television as the display system for your LC or LC II? Ah, but you can, with the L-TV card, from Lapis Technologies. The question is, Should you bother?

First, a caveat: The L-TV isn't meant to let you replace your monitor with a television: TV resolution isn't good enough to supplant your Mac monitor for everyday jobs. Instead, it's aimed at those who need supplemental video output for demonstration purposes — a teacher in a

classroom, for instance, or a presenter who travels to sites where televisions are easier to find than monitors.

The L-TV setup consists of a video card and software drivers. It doesn't include the various cables and connectors you need in order to actually hook up the TV or the RF modulator (which you need if the TV doesn't have a monitor input and you're not running the signal through a VCR). The bare-bones documentation leaves even experienced Mac users with questions, so it's bound to disconcert the less experienced (although you can always call the company's stellar tech-support staff).

Still, ease or difficulty of setup hardly matters with a product like this, where looks are everything. And the looks just aren't good enough, even for a classroom setting and an undemanding audience. Text is blurry on the screen — you need to use at least a bold, 14-point font to make it readable. And despite several software settings for jitter control, text shimmers enough even at the best setting to

make you rub your eyes after just a few moments.

Viewing graphics is a different story, because fine details aren't so important. But animation — which uses its own jitter-control settings — is sloooooow. In fact, the L-TV slows the LC's overall operation to the point that when you close a window on the desktop, the standard zoom effect appears as a discrete series of shrinking rectangles.

The L-TV is a nifty idea, without a doubt, and it's the only product that does what it does. But if shimmying text and slow-dancing animation just won't cut it for your demo needs, you and your Mac might want to sit this one out — and perhaps wait for the \$499 L-TV Pro (just announced at press time), which includes a mode called Stabilize, which Lapis claims will eliminate flicker entirely.

Lapis Technologies, Inc., 1100 Marina Village Parkway, Suite 100, Alameda, CA 94501; 800-435-2747 or 510-748-1600. \$349.

— Sharon Zardetto Aker

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Agfa Arcus—133 line screen, factory default settings.

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Hewlett Packard Scanjet IIc—133 line screen, factory default settings.

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"La Cie's Photoshop plug-in is a delight to use." Macweek

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you'd better see ours.



Microtek ScanMaker II—133 line screen, factory default settings.



Silverscanner II—133 line screen, factory default settings.



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line art

HP Scanjet IIc 800 dpi
line art

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Hard Drives

a

dmitt it: You probably thought the folks who bought those high-capacity, high-performance hard-disk drives — you know, the drives measured in gigabytes — had money to burn. They wanted big, fast storage, so they went out and bought it, no matter what the price. Meanwhile, you've gotten by with a 100- or 200-megabyte hard drive, because that's what you could afford.



***If you need
more storage but
have been stymied
by gigabyte sticker
shock, now may
be the time
to buy.***

BY MARK HILL

1- and 2-Gigabyte Hard Drives

Who Are You?

Hard drives are a lot like underwear — one size or style does not fit all. What you do with your Mac can make a big difference in what storage device you should consider.



QuickTime Users

QuickTime applications create enormous files. They write and read those files in large, contiguous transactions. So if you're creating and editing QuickTime files, you'll need a drive that not only can store huge amounts of data but can also support high sustained data-transfer rates. Drives that spin their disks fast and disk arrays usually offer the highest sustained data-transfer rates.



Word-Processor and Spreadsheet Users

If you spend most of your time working in word-processing and spreadsheet applications, your files are smaller than those of graphics users and your applications don't spend much time accessing your disk. For instance, a single page of double-spaced, unformatted text in Microsoft Word takes up about 6K. So you can fit 262,144 pages of text on a 1-gigabyte disk. A slower, less expensive 1-gigabyte drive might make a lot more sense for you than a higher-priced, higher-speed, higher-capacity drive.



Photoshop Users

If you're a heavy graphics user, you know that you tend to create large files and that the speed of your hard drive has a great impact on how much work you can accomplish in a day. Graphics applications can reap some speed improvements with a disk array, but for the money, a single drive with a large and efficient cache will give you a bigger bang.

— Mark Frost

Well, take another look at your budget. These days, gigabyte-hard-drive prices are dropping well below \$2,000, and the drives can fit inside almost any Mac. Consider System 7's 32-bit-addressing capabilities, the Finder's improved filing capabilities, AppleShare 4.0, and faster Macs with improved SCSI implementations (particularly the Quadra family), and all of a sudden a gigabyte drive makes sense. But which one makes the most sense for you?

The 37 drives we evaluated for this report range in capacity from 800 megabytes to 2.6 gigabytes (or 2,500 megabytes) and range from \$1,449 for the La Cie 1-megabyte Cirrus 1000Q to a street price of \$8,655 for the Storage Dimensions 2-gigabyte SAZ-2610F2 (see Table 1). Four of the products we tested — the FWB SledgeHammer 2000FMF, the PLI MiniArray 2 GB and MiniArray 040, and the Storage Dimensions SAZ-2610F2 — are disk arrays, sometimes referred to as *RAID* (redundant array of inexpensive disks) devices. In an array, the data stream from your Mac is split by your SCSI processor across two or more drives. Because an array takes advantage of the sustained-throughput characteristics of each of its component drives, the speed increase is theoretically cumulative, with two drives offering twice the speed of a single drive, and so on.

In practice, the real speed impediment to a high-performance drive is the Mac to which it's attached. Speed can be limited either by the processing power of the Mac's CPU, the Mac's SCSI processor, or both. If you plan to hook one of these drives up to a Mac SE, for example, don't expect it to run much faster than your old 40-megabyte Quantum drive, because the SE's SCSI controller isn't terribly quick.

But there's more to the story than speed. We looked at everything these drives had to offer, from the quality of their accompanying documentation and software to the sturdiness of

MacUser LABS Figure 1: Fast Driving

Street price

\$1,449	La Cie Cirrus 1000Q
\$1,499	APS Toshiba 1.2 GB
\$1,499	Third Wave 1.2 GB
\$1,549	Spin Peripherals 1.2 GB
\$1,699	▶ APS Micropolis 1.2 GB
\$1,699	La Cie Cirrus 1200Q
\$1,699	MacProducts Magic 1.2 GB
\$1,699	Relax 960 MB
\$1,799	Focus 1.2 GB
\$1,799	▶ Loviel 1225 MB
\$1,899	Insight Power Drive 1075
\$1,899	Liberty 870 MB-T
\$1,899	Saturae Edge 1000r
\$2,100	GCC UltraDrive 1000S
\$2,350	Optima MiniPak 1000
\$2,375	FWB Hammer 1000FMF
\$2,400	CMS Platinum II Enhanced 1.0
\$2,499	Third Wave 2.0 GB
\$2,598	MacDirect 2400
\$2,699	Liberty 1.2 GB-Q
\$2,799	MacProducts Magic 2.1 GB
\$2,799	Saturae ProLine 1910hz
\$2,899	Insight Power Drive 1750
\$3,050	Dynatek HDA 1.2 GB
\$3,180	Storage Dimensions MAC B-1000F
\$3,600	▶ FWB Hammer 2000FMF
\$3,815	Micropolis Microdisk
\$4,225	▶ GCC UltraDrive 2000X
\$4,300	▶ FWB SledgeHammer 2000FMF
\$4,300	Optima Concorde 2100
\$4,435	Dynatek HDA 2.0 GB
\$4,480	CMS Platinum II Enhanced 2.0
\$5,215	PLI MiniArray 2 GB (external)
\$5,445	PLI 2.1 GB Turbo
\$5,785	PLI MiniArray 040 (internal)
\$6,260	Storage Dimensions MAC I-2030F-1
\$8,655	Storage Dimensions SAZ-2610F2

▶ MacUser's "Bottom Line" pick
 ■ The best performer

Overall Speed:

You might think that more money means more speed — but in the case of 1- and 2-gigabyte hard drives, you'd be wrong. This chart shows how much time each drive took to complete all of our speed tests. The drives are listed in order of price, with the least expensive drive on top. Notice that the \$1,699 APS Micropolis 1.2 GB drive took less than 30 seconds longer than each of the two \$5,000+ PLI MiniArrays to complete our speed tests.

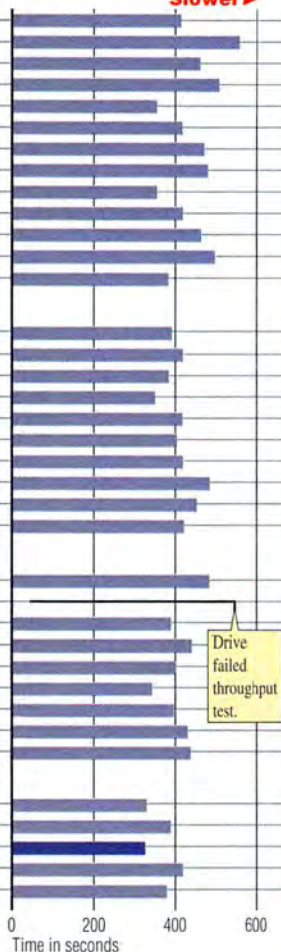
QuickTime Quickies:

If you're heavily into QuickTime, you need a drive with high sustained data-transfer rates, one that either spins faster



Overall Speed

Slower ➤



QuickTime Quickies

Slower ➤



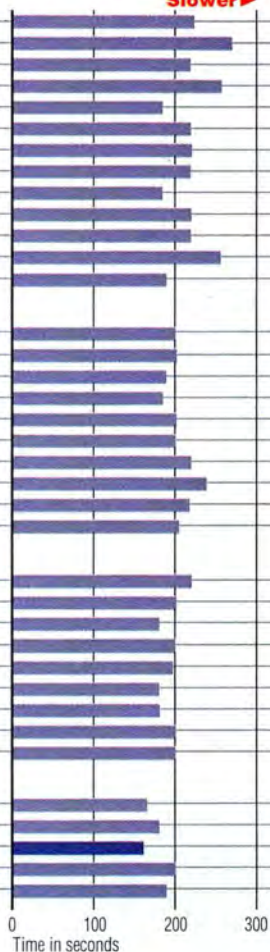
Finder Findings

Slower ➤



Photo(shop) Finish

Slower ➤



or fits more data onto each track. Because 5.25-inch disks have a larger circumference than 3.5-inch disks, their outer tracks hold more data. The 2-gigabyte drives, which were all based on 5.25-inch mechanisms, did well on this test, but the disk arrays did the best. The arrays in this report, especially the Storage Dimensions array, seemed optimized for high-sustained-throughput applications, because they split the data stream from your Mac across two or more drives. Remember, try to match your drive to your application — if your QuickTime digitizer can handle only as much as 5 megabytes of video data per second, there's no use buying a 10-megabyte-per-second array — it won't make your movies any smoother.

Finder Findings:

If you spend most of your time in the Finder or a word-processing or spreadsheet application, sustained throughput isn't that important. These applications move data in little chunks, so what really helps is a large, efficient caching system. The drives that are based on the 3.5-inch mechanisms really smoked in this test. Why? Because these drives are generally newer and they have more-sophisticated caching schemes that are better suited to small-chunk transactions. Notice that the \$1,449 La Cie Cirrus 1000Q beat the \$8,000+ Storage Dimensions SAZ-2610F2 disk array in our Finder duplicate test by almost 60 seconds.

Photo(shop) Finish:

In general, Photoshop moves data in small chunks. It differs from the Finder in that it uses your disk as a scratch area if you can't fit both the image you're displaying and its Undo copy into RAM. Compared with those of our other tests, the results in our Photoshop rotate test varied the least. But for the money, an array might not be the best choice. Notice that the \$1,699 APS Micropolis 1.2 GB drive was only about 20 seconds slower than the fastest PLI array, which costs \$5,785. Some might say that power Photoshop users don't care about price — they just want the fastest thing out there. If that's true, they ought to buy bucketfuls of RAM.

1- and 2-Gigabyte Hard Drives

Buying a drive doesn't have to mean killing a tree.

their construction. We evaluated the entire purchasing experience of unpacking, setting up, and using each drive on our test-unit Quadra 950, and we rounded out the process by

challenging each vendor's technical-support staff. The overall quality was surprisingly good, but we did find some products to avoid.

On Time and In One Piece

The biggest, fastest hard drive won't do you much good if it arrives in pieces. And it won't do our planet much good if we clog our landfills with excessive packaging. So we carefully examined how well each manufacturer's packaging protected the drive and how many resources it sacrificed in the process.

We've seen a trend toward smaller, more efficient packaging systems, and we like it. A surprisingly high number of the products tested — 19 of 37 — got top ratings for efficient

packaging strategies. Only the PLI MiniArray 040 got a thumbs-down for wasteful packaging.

Your Papers, Please

After taking stock of what comes in the box, most of us are eager to get set up. But unless you're an experienced user, you shouldn't jump into the setup process without first reading the instructions. In some cases, we didn't find much to read.

The Storage Dimensions MAC B-1000F and MAC 1-2030F-1 drives arrived with outdated documentation that did not address SCSI-2 or the installation of the SCSI card included with the drives. Storage Dimensions told us that it is no longer using standard manuals for these particular

On the Horizon

If you're in the business of making QuickTime clips, your storage future is looking mighty rosy. At this time last year, we were amazed when we got our first peek at 3.5-inch drives capable of storing a gigabyte of data. Well, be prepared to be further amazed, because as we went to press, some major hard-drive-mechanism manufacturers began squeezing 2 gigabytes into 3.5-inch mechanisms.

IBM and Seagate are the first companies to offer 2-gigabyte, 3.5-inch mechanisms. And both mechanisms should be suited for QuickTime users, because QuickTime recording and playback stress a drive's sustained data-transfer rate.

Seagate's new Barracuda mechanism, in 1.4- and 2-gigabyte capacities, offers sustained data-transfer rates better than those of any of the arrays tested in this

report, with the exception of the Storage Dimensions SAZ-2610F2. The Barracudas accomplish this by spinning their disks at a rate of 7,200 rpm — faster than any other drive mechanism now available for desktop computers. Barracudas are currently available with Fast SCSI-2 cards. But soon they will include Fast-and-Wide SCSI-2 cards, which the company expects will enable drives based on them to reach even higher sustained data-transfer rates.

IBM has introduced a 2-gigabyte, 3.5-inch mechanism that looks equally awesome. Although we didn't get to test this mechanism's performance, the specs promise a lot. Instead of spinning the disks faster to increase sustained throughput, IBM has increased *bit density* — the amount of data you can store on each track. To put it simply, there are only two ways you can increase data-transfer speed: increase the rotational speed — as does Seagate — or increase the number of blocks per track and spin at the same rate — as does IBM. By keeping the rotational speed down, IBM claims, its mechanism uses less power and runs cooler and more quietly than the faster-spinning Barracuda mechanisms. We weren't able to check out IBM's assertions, but the Barracuda we examined was indeed loud and could probably cook burritos in your Quadra if you left the front panel open.

— Mark Frost



With a full megabyte of cache RAM and a rotational speed of 7,200 rpm, Seagate's 2-gigabyte Barracuda is most likely the fastest high-capacity hard-drive mechanism available to Mac users. But be forewarned: Our tests showed it to be optimized for applications where high sustained data-transfer rates are critical, such as with QuickTime, rather than for small block transfers.

drives, opting instead for documentation based on index cards. We never got to see the card-based instructions, despite two follow-up requests. In contrast, the Storage Dimensions SAZ-2610F2 array comes with a 109-page user's guide.

The two Liberty drives — the 870 MB-T and the 1.2 GB-Q — each came with a single sheet of paper, which passed for the user's guide. The sheet contained all the important information about such things as setting SCSI ID, connecting the drive to the CPU, formatting the disk, and even connecting to a PC-compatible. However, each topic was covered so briefly that the information would be useless to novice users, and there were no illustrations. Worse was Loviel, which provided no documentation specific to its hardware. Enclosed with the Loviel drive was a software manual that consisted of 32 loose photocopied sheets. This document provided limited hardware information for *internal* drive mechanisms but no mention of the Loviel 1225 MB external drive.

Setting Up for the Gig(s)

After you've learned everything you can from the manual, it's time to set up. In some cases, this means installing an internal drive or SCSI card in your Mac. This is where many users get hung up on SCSI problems, including termination, ID-number assignment, and even defective cables. During the setup phase, we always make careful notes about any problems we have getting the hardware or software to work properly. We suggest that you do the same, because it will help you and the vendor's tech-support staff solve any problems more quickly.

The PLI 2.1 GB Turbo arrived without the Turboware utility mentioned on the packing list. And when we tried to format the PLI MiniArray 040 internal array, the formatter recognized only 1 gigabyte of the 2-gigabyte drive, even though this glitch didn't occur when we set up

MacUser LABS Data Plumbing

A large, fast data-storage device is a wonderful thing to have. But if the pipe it uses to send and receive data leaks, the wonder fades quickly indeed.

We predicted that drives costing more than \$1,000 would include a high-quality SCSI cable. Unfortunately, we found several drives that included cables that would have been more at home on a bargain-basement 40-megabyte drive.



High-Quality Cable

This is the sort of cable you ought to get with any drive, but especially if you're buying a high-capacity, high-speed drive:

- The individual wires are of a heavy gauge and are individually insulated.
- Data wires are paired and twisted together with their corresponding ground wires to prevent signals from bleeding onto adjacent data wires.
- The wires are then wrapped in insulating foil to reduce external interference and line impedance.
- The paired, twisted, and wrapped wires are then enclosed in a wire braid to prevent kinking and reduce interference. In good cables, this braid is soldered to the outer metal housing of each connector for grounding.
- Finally, all of this is covered by a plastic sheath.



Bargain-Basement Cable

This is the kind of cable you do not want to see bundled with your new high-capacity hard drive. The individual wires are of a very thin gauge, and signal lines are not paired with their ground wires.

In contrast to those of a better cable, the wires in these lower-quality cables are protected only by foil wrap and a plastic sheath.

— Mark Frost

1- and 2-Gigabyte Hard Drives

the PLI MiniArray 2 GB external array. It took a few software updates and some time on the phone with PLI before we finally learned the magic key sequence and password required to get the software to offer special formatting for the Mini-Array(s). PLI's explanation was that the company wanted the array options hidden from the majority of its customers, who purchase single-drive mechanisms. We think the PLI arrays would be a better deal if they came with special documentation and more-straightforward software.

We experienced installation problems with the PLI MiniArray 040

**Easy
plug-
and-play
installation?
Give me a
break!**

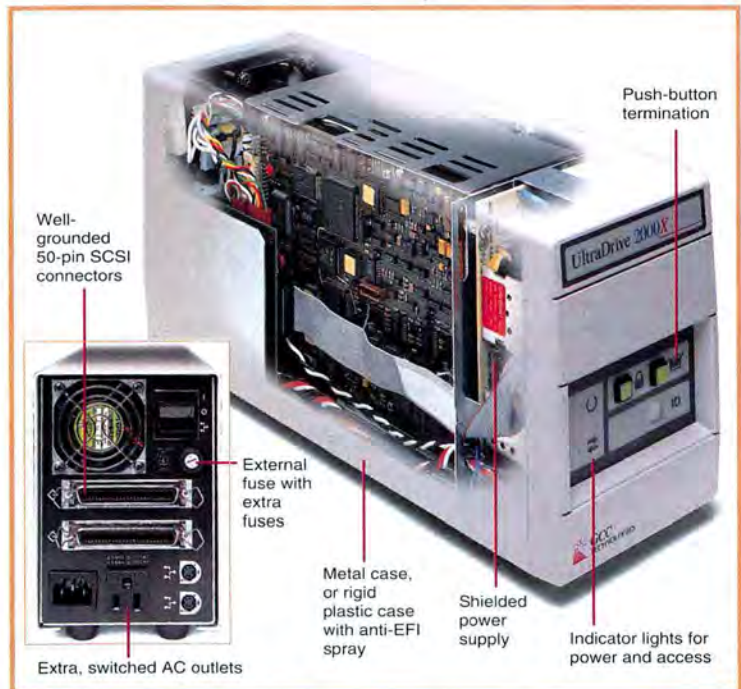
internal assembly even prior to the formatting glitch, however. Instructions for installation were simple, easy to follow, and well illustrated, although the print was small. But we had to do some careful manipulation (and even a little bending) in order to fit the drives into the PLI mounting brackets. And when we finally got the drives to fit, the screw holes on the brackets were not well aligned with the Quadra's mounting-tray holes — even though the assembly was designed for the Quadra.

In contrast, setting up the PLI MiniArray 2 GB consisted of simply installing the PLI Quick SCSI card and then attaching the array to the card with a supplied cable. Each of the three Storage Dimensions drives also included a Fast SCSI-2 host card. These cards plug in to the Quadra's PDS (processor-direct slot) rather than a NuBus slot. Unfortunately,

Figure 2: Everything but Speed

Design and Construction

A hard drive, like anything else, is only as good as its weakest component. To see how committed each vendor is to building a robust product, we opened each drive and cut open every SCSI cable. We awarded a maximum of 32 points for various design and construction attributes. Here are some of the most important features we looked for:

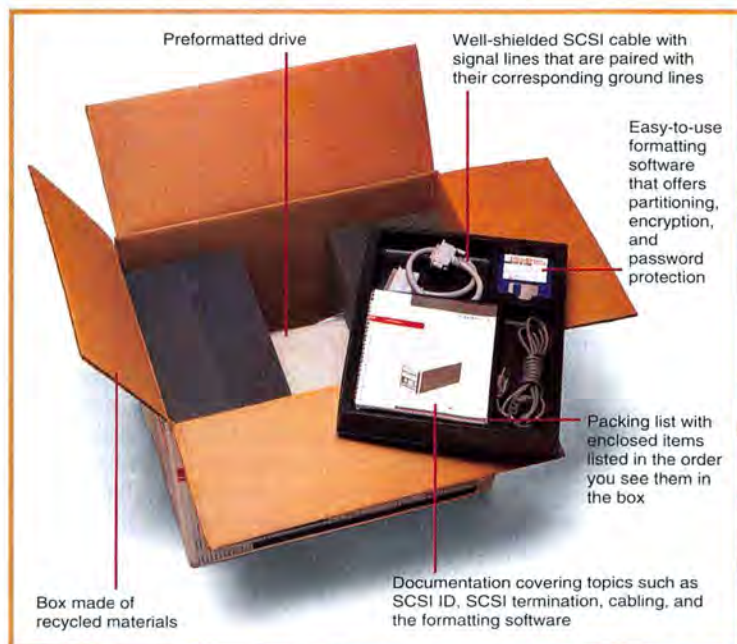


Product	Score	Product	Score
▶ GCC UltraDrive 2000X	24	Micropolis Microdisk	19
▶ FWB SledgeHammer 2000FMF	22	Dynatek HDA 2.0 GB	19
▶ Loviél 1225 MB	21	PLI 2.1 GB Turbo	19
CMS Platinum II Enhanced 1.0	21	Storage Dimensions MAC 1-2030F-1	19
Saturae ProLine 1910hz	21	Relax 960 MB	18
▶ FWB Hammer 2000FMF	21	Saturae Edge 1000r	18
CMS Platinum II Enhanced 2.0	21	Optima Concorde 2100	18
▶ APS Micropolis 1.2 GB	20	Optima MiniPak 1000	17
GCC UltraDrive 1000S	20	Storage Dimensions MAC B-1000F	17
FWB Hammer 1000FMF	20	Focus 1.2 GB	16
PLI MiniArray 2 GB	20	MacProducts Magic 1.2 GB	15
Storage Dimensions SAZ-2610F2	20	Insight Power Drive 1075	15
APS Toshiba 1.2 GB	19	MacProducts Magic 2.1 GB	15
Third Wave 1.2 GB	19	Insight Power Drive 1750	15
Liberty 870 MB-T	19	Spin Peripherals 1.2 GB	14
Third Wave 2.0 GB	19	La Cie Cirrus 1200Q	14
MacDirect 2400	19	La Cie Cirrus 1000Q	13
Liberty 1.2 GB-Q	19		
Dynatek HDA 1.2 GB	19		

▶ *MacUser's "Bottom Line" pick*

Packaging, Documentation, and Service

You shouldn't have to go through installing your drive blind and alone. When you open your new drive's box, you ought to find a packing list that tells you what you get for your money and a number to call if it isn't all there. Furthermore, easy-to-follow instructions are essential. We looked at the things that make installation a pleasure instead of a pain, allowing a total of 32 points for packaging, documentation, and service. Here are some of our major considerations:



Product	Score
Storage Dimensions SAZ-2610F2	27
▶ FWB SledgeHammer 2000FMF	26
▶ APS Micropolis 1.2 GB	25
▶ GCC UltraDrive 2000X	25
▶ FWB Hammer 2000FMF	24
APS Toshiba 1.2 GB	23
Optima MiniPak 1000	23
FWB Hammer 1000FMF	23
Storage Dimensions MAC B-1000F	23
Optima Concorde 2100	23
Storage Dimensions MAC 1-2030F-1	23
La Cie Cirrus 1000Q	22
La Cie Cirrus 1200Q	22
Saturae Edge 1000r	22
GCC UltraDrive 1000S	22
Saturae ProLine 1910hz	22
MacDirect 2400	20
MacProducts Magic 2.1 GB	20
Third Wave 1.2 GB	19

Product	Score
MacProducts Magic 1.2 GB	19
▶ Loviél 1225 MB	19
Focus 1.2 GB	19
CMS Platinum II Enhanced 1.0	19
Third Wave 2.0 GB	19
CMS Platinum II Enhanced 2.0	19
Dynatek HDA 1.2 GB	18
Dynatek HDA 2.0 GB	18
Insight Power Drive 1075	17
Insight Power Drive 1750	17
PLI MiniArray 2 GB (external)	17
Spin Peripherals 1.2 GB	16
Liberty 870 MB-T	16
Liberty 1.2 GB-Q	16
Micropolis Microdisk	16
PLI 2.1 GB Turbo	16
PLI MiniArray 040 (internal)	16
Relax 960 MB	14

▶ *MacUser's "Bottom Line" pick*

the Storage Dimensions Data Cannon Fast SCSI-2 cards fit poorly into the Quadra's PDS — in fact, they were so wobbly that we had to exercise extreme care when we were plugging in the SCSI-2 cable, in order to avoid unseating the card from the slot. Then an outdated ROM chip on the cards caused some formatting problems and had to be replaced. One final disappointment with Storage Dimensions' MacinStor formatter came when we learned that it could recognize only about 2 gigabytes of the 2.6 gigabytes available on the SAZ-2610F2 array.

Make Mine a Quickie

We designed several speed tests to look at three types of disk use: sustained throughput (or sustained data-transfer rates), which is critical for QuickTime users; small block transfers, which is how most Mac applications move data to and from drives; and caching and sustained speed, which is important for applications such as Photoshop. The tests and our test platforms are described in more detail in the "How We Tested Gigabyte Drives" sidebar.

Big Stuff. If you plan to play QuickTime videos or even create them, you'll be interested in the results of our throughput (DiskTop copy) test (see Figure 1). The Storage Dimensions SAZ-2610F2 array, based on a Seagate mechanism, excelled in this test. All the products based on the Seagate ST42400N (Elite 2) mechanism also did well. In addition, the drives based on Micropolis mechanisms, especially the PLI MiniArray 2 GB external drive, scored high in the throughput test. (To see which drives use which mechanism, see Table 1.)

Products based on the Digital Equipment mechanism, with the exception of the FWB SledgeHammer 2000FMF and the PLI MiniArray 040, were unimpressive in the DiskTop copy test. These arrays take advantage of the Quadra 900's and 950's unique SCSI architecture by

1- and 2-Gigabyte Hard Drives



**If you
don't use
QuickTime,
forget about
sustained
throughput.**

hooking one mechanism to the external SCSI port and one to the internal port and splitting data between the two.

Other Findings. The Finder, like most Mac applications, reads from and writes to drives in much smaller chunks than DiskTop does, so we duplicated numerous files in the Finder to test small block transfers. For the most part, the 1-gigabyte drives we tested for this report were newer and had larger and more sophisticated caches than the 2-gigabyte drives.

Photo Finish. Our Photoshop rotate tests yielded few surprises.

Photoshop is a very disk-intensive application that can take advantage of high sustained data-transfer rates and efficient caching. Because none of the drives excelled in both of these areas, the relative results were pretty flat. The only major exceptions were the drives based on Toshiba mechanisms, which were slower, because of their lower rotational speed.

Server Apps. Finally, we took a quick look to see how well suited the arrays were for file-serving applications. All the arrays outperformed drives based on single mechanisms — but not by much — in the network-server test. The FWB Sledge-Hammer 2000FMF was only 25 percent faster than the single-drive FWB Hammer 1000FMF (both are based on Digital Equipment mechanisms). Paying 100 percent more for a 25-percent speed improvement doesn't make much sense.

Built to Last

Even the best drive mechanism can be ruined by a poorly engineered power supply or a poorly ventilated enclosure. This means that your decision about which drive to buy may

well come down to design and construction considerations, along with warranty and service issues.

Case designs varied dramatically. Some of the things we looked for were sturdiness, electromagnetic shielding, ventilation, and even the construction of the SCSI cables.

GCC's two drives got excellent marks for construction, with the GCC UltraDrive 2000X taking top honors (see Figure 2). This winner is built with multiple brackets that hold the drive assembly steady. Shielding surrounds the power supply, and there are additional shielding and sound-deadening layers inside the cover. Clearly marked labels on the wiring promise to make service quick and easy. You can activate write protection and internal SCSI termination from well-placed buttons on the front of the case, where you also find the SCSI-ID number displayed.

The Focus 1.2 GB and the two drives from Liberty had almost-identical compact metal cases. Their size is great for portability, but these small cases may offer less protection than the larger enclosures. No fan is included to cool the Liberty drives;



How We Tested Gigabyte Drives

Our test platform for this report was a Quadra 950 with 64 megabytes of RAM running System 7.1. After some pretesting, we decided on a system cache of 32K, because that cache size allowed optimum application speed in all of our tests. As the system-cache size increased, however (particularly when it reached 768K or above), all the test times increased dramatically. We ran our tests with file sharing, AppleTalk, and virtual memory turned off and 32-bit addressing turned on. An Apple 13-inch color monitor ran 16-bit color off the Quadra's built-in video.

We evaluated the effectiveness and efficiency of each product's packaging, focusing on whether or not the packaging used recycled materials and soy-based inks. To see how easy it was to install each unit, we looked at its accompanying documentation and software.

Vendors got points for thorough manuals with indexes, quick-install instructions, and easy-to-find tech-support numbers.

To examine each drive's sustained data-transfer rate, we copied a 120-megabyte file with DiskTop, which moves data in large chunks. To see how efficient each drive's cache was, we copied 17 megabytes' worth of 32K files in the Finder.

Next, we rotated a 64-megabyte image in Photoshop 2.0.1. This very disk-intensive test takes advantage of both sustained data-transfer rate and small block transfers. Because we had the room, we gave Photoshop 60 megabytes of RAM.

To test the drives as network servers, we set up an AppleTalk network of 50 nodes connected by Ethernet. Each of the 50 nodes used an Asanté Ethernet

card. The server was a Quadra 950 with 8 megabytes of RAM, running System 7.0.1. The four disk arrays included in the evaluation as well as a single Digital Equipment mechanism, a single Quantum mechanism, and a single Toshiba mechanism took turns as the server storage device. We ran an MPW (Macintosh Programmer's Workshop) application to simulate network traffic. Forty of the 50 nodes copied ten 110K files every ten seconds over the network. With this "noise" running in the background, we timed how long it took to copy a 5-megabyte file off the server to a Mac IIci.

When all the tests had been completed, we opened the drives to look at their construction and cut open each drive's SCSI cable to check for shielding and grounding.

— Kristina De Nike

possibly Liberty believes that the cases' wraparound metal skins act as heat sinks, but we're not convinced that this is a good practice. La Cie's Cirrus Q drives also are compact, each with a metal-reinforced plastic case designed for vertical operation. However, the Focus back panel sports two 50-pin SCSI connectors, compared with two 25-pin connectors on the Liberty and La Cie drives.

If you've ever opened a fan-cooled Mac or hard drive and found the interior covered with a fuzzy coating of dust, then you can appreciate the advantage of a filtered air intake. An accumulation of the fuzzy stuff can cause overheating, but on the other hand, so can a clogged air intake. The APS drives were the only products in this roundup to feature a removable, washable air filter on the fan intake. Optima went so far as to install two fans in the Concorde 2100 drive — one for the power supply and one for the disk mechanism and controller circuitry.

How Do I Work This?

Suppose you've purchased the perfect high-capacity drive for your system but you can't get it to work. Don't feel dumb — it happened to us with several of these products. Many times the fix was as simple as calling the company, getting an RMA (returned material authorization) number, and sending the product back. Usually the replaced or returned drive had no problems.

But if you're even more fortunate, the manufacturer's technical-support staff will be able to help you solve your problem over the phone, toll-free. We tested the technical-support prowess of each vendor by asking a straightforward how-to question about partitioning the disk. We also introduced an error on each disk that we knew could be fixed with Apple's Disk First Aid or another disk utility. Then we asked each vendor to help us fix the problem we'd introduced. A surprisingly high percentage of our contestants provided the

MacUser LABS Rating Tech Support

Try as they might, hard-drive manufacturers can't make all of their products 100 percent trouble-free. There's a chance that sooner or later, you'll be calling tech support for some help. And obviously, when it's your hard drive that's on the fritz, you want good help, pronto.

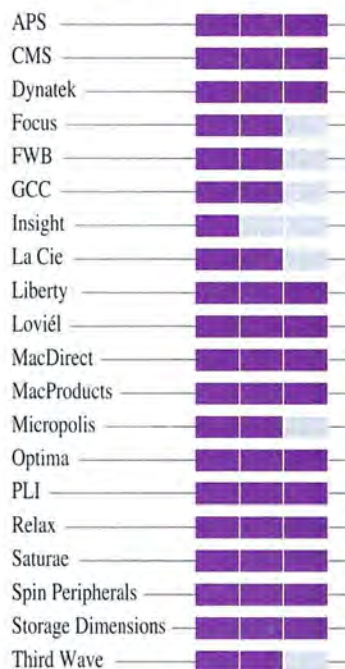
So our technicians placed two anonymous tech-support calls to each of the vendors represented in this report. Instead of the usual installation questions, we asked questions that tested the technicians' knowledge of their products' bundled software. Because of this, there was no single correct answer — the answer depended on what software was included with each drive.

Q. I want to format my hard disk as two 100-megabyte partitions (one of which will be my boot partition), a 300-megabyte partition, and the rest as one big partition. How do I do this?

A. The technician should walk the user through the partitioning procedures applicable to the formatting software included with the drive.

Q. My boot disk mounts OK, but then I get a message saying my new disk (not the boot volume) is damaged, prompting me to initialize it. I have valuable data, not yet backed up, and I need to get my drive up and running again. How do I fix it?

A. Possible correct answers include instructions on the use of bundled disk-repair software — such as Disk First Aid, Norton Utilities, Public Utilities, or MacTools — or on how to send the unit back for repair.



right answer to both questions. The major differences among the technical-support staffs were in how quickly they responded. Sometimes we had to wait as long as 24 hours for a callback.

Insight fell short of our expectations. When faced with our simple data-recovery problem, which could have been handled by any of the popular disk-recovery utilities, the Insight technician and the supervisor told us not to bother with recovery — that "not even Norton would help." They recommended that we just reformat the disk and accept the loss of our data. For a quick rundown of technical-support performance, see the "Rating Tech Support" sidebar.

Cheap Enough for Ya?

It's only a matter of time before gigabyte drives fall within everyone's budget. Storage in the gigabytes will eventually become the focus of the market, replacing today's 100- and

**A gig
for less than
a grand?
Soon, very
soon.**

1- and 2-Gigabyte Hard Drives

► The Bottom Line

If there was ever a time to seriously consider purchasing a 1-gigabyte or larger hard drive, this is it. Although we have gripes about many of the drives in this report, almost all of them are still worth the money. And as usual, some of the drives stood out from the rest.

At the 1-gigabyte level, we witnessed some incredible performances from the drives based on the Digital DSP3105 and the Micropolis 2112 mechanisms. We also saw some amazingly low-priced drives based on the Toshiba MK538FB mechanism. But the overall winning combination of software, documentation, design and construction, speed, and after-sale support belongs to the **APS Micropolis 1.2 GB** (\$1,699 direct). Although its documentation was weak, solid construction backed by a good warranty and prompt tech support made the **Loviél 1225 MB** (\$1,799 direct) the logical runner-up.

The 2-gigabyte drives in this report were all based on older, 5.25-inch mechanisms, which, although faster for sustained data-transfer rates, lag behind their 3.5-inch, 1-gigabyte siblings in most other tasks. Still, in terms of per-megabyte cost, 2-gigabyte drives are some of your best bets. There were less expensive 2-gigabyte drives, but we

liked the **FWB Hammer 2000FMF** (\$4,529 list, \$3,600 street) best. Its solid construction, excellent Hard Disk ToolKit (HDT) software, and aggressive price put it at the top of the 2-gigabyte pile. Right behind the Hammer 2000FMF is the **GCC UltraDrive 2000X** (\$4,699 list, \$4,225 street). The UltraDrive 2000X's case is the best we've ever seen.

We had high expectations for the disk arrays, and we were only partly disappointed. They were excellent in

terms of sustained throughput — an important consideration if you plan to do any serious work with QuickTime — but they were less than spectacular in our other speed tests. Not only that, but the prices of most of the arrays tested in this report were mind-numbing. Our pick of the bunch is the **FWB Sledge-Hammer 2000FMF** (\$4,899 list, \$4,300 street). It wasn't the fastest, but its well-designed software and reasonable price made it the obvious choice.



The APS Micropolis 1.2 GB (top left) offered the best value of the 1-gigabyte drives, followed by the Loviél 1225 MB (bottom left). The FWB Hammer 2000FMF (center) took top honors among the 2-gigabyte drives, with the GCC UltraDrive 2000X (top right) second. The best of the arrays was the FWB SledgeHammer 2000FMF (bottom right).

200-megabyte drives. But if you need their capacity and the performance today, take a look at the prices of these gigabeauties. Chances are, you've already spent more money on a color printer or video-display card.

If you're ready to take the plunge and are looking for a drive to attach to your AppleShare 4.0 file server,

arrays don't yet seem to be the answer. If you're interested in doing some QuickTime work, look to one of the 5.25-inch, 2-gigabyte drives. Their size and high rotational speeds make them ideal for QuickTime digitizing and playback. And if you spend most of your time working with spreadsheet, word-processing, or graphics applications, a 3.5-inch, 1-gigabyte drive based on either the Micropolis 2112 or the Digital Equipment DSP3105 mechanism might give you the best performance bang for your buck. For our specific recommendations on which vendors offer the best value in 1-to-2-gigabyte drives, check out the "Bottom Line" sidebar.

Mark Hill is a (now relaxed) free-lance writer in Austin, Texas. Kristina De Nike, a ZD Labs project leader, directed the ZD Labs testing effort for this report.

Table 1 Criteria

List price — The vendor's suggested retail price for the drive.

Street price — The average price of the drive at dealers surveyed across the U.S. in March 1993 or through mail order.

Formatted capacity — The amount of usable storage space available on the drive after formatting, in megabytes.

Mechanism — The make and model number of the internal mechanism used in the drive.

Formatter — Software for formatting the drive for use with a Mac.

Turnaround time — The guaranteed maximum time to repair or replace a product.

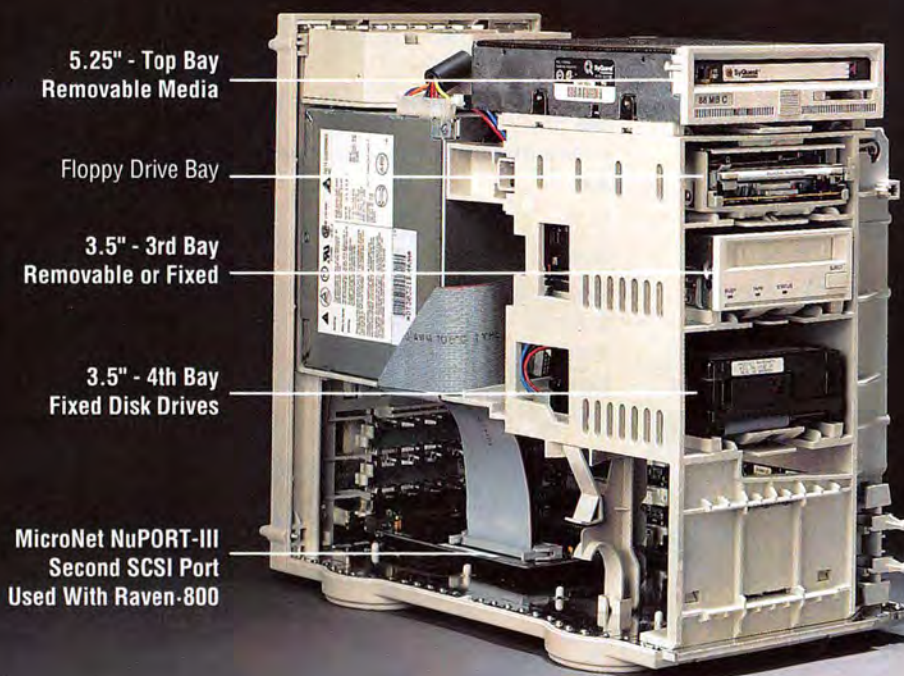
FCC Class B cert. — According to the FCC, peripherals designed to work with home computers should be certified as Class B devices. Products that pass only the Class A standard should not be sold in the consumer market.

**A
RAID
array for
your AppleShare
server? Think
again!**

continues ►

Disk Array Power!

Performance Matched With
Apple Workgroup Server 80



Raven-800
Two Drive Disk Array



MicroNet's Raven-800. Disk Array Power For The Quadra 800.

MicroNet is the first to bring disk array power to the Quadra 800. With a matched pair of fast spindle drives, the Raven-800 delivers up to 9.2 MB/second sustained transfers with access time as fast as 4 ms.

Disk arrays can improve performance up to 400 percent over standard drives. Combine MicroNet's Raven-800 disk array with the speed of the Quadra 800 and you have an unbeatable system for applications such as PhotoShop, file servers, and full rate digital video and audio recording.

Cost effective two drive disk arrays are available in capacities of 1030 to 5560 MBytes and are expandable to more than 38 GBytes. MicroNet also offers single disk drive systems that can be upgraded to a Raven-800 disk array at a later date.

Built on award winning technology, the Raven-800 takes full advantage of Apple's existing hardware. One drive connects to the native SCSI port of the Quadra, and one connects to a MicroNet NuPORT-III, SCSI-2 host adapter. Together, these two drives create a fast, parallel, 16-bit data path.

MicroNet has designed a complete family of internal storage systems for the Quadra 800. Included are SyQuest removable systems, rewritable optical drives, and DAT backup systems. All are shipped complete with custom designed bezels.

To put high performance disk array power in your Quadra 800, call MicroNet's Sales Department for configuration assistance or the name of your nearest Reseller. 1-714-581-1540.



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CIRCLE 198 ON READER SERVICE CARD.

1- and 2-Gigabyte Hard Drives

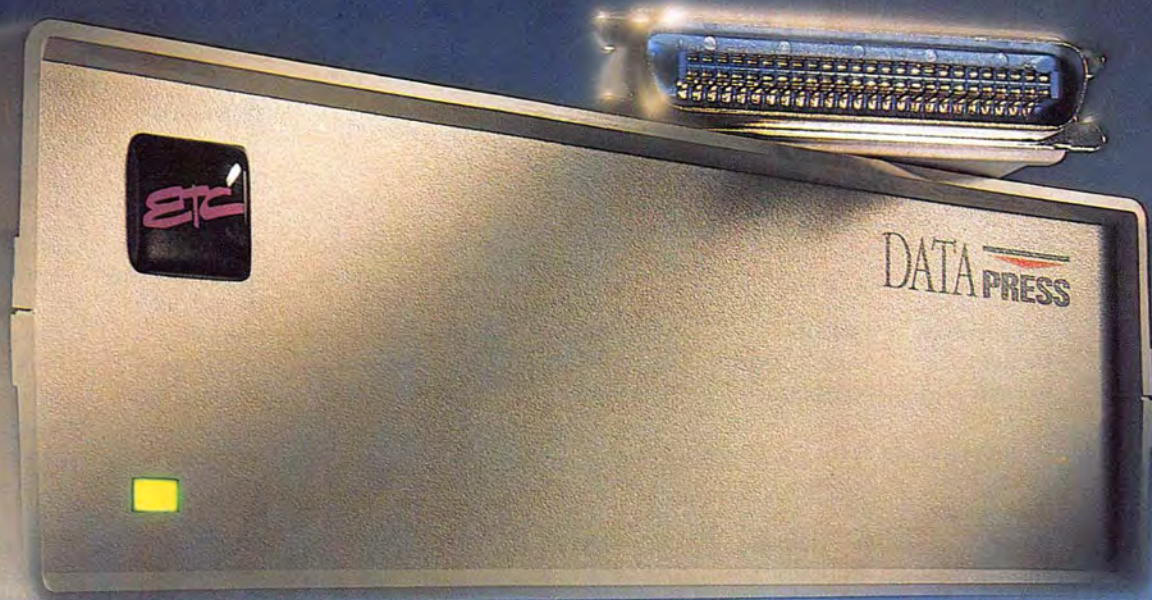
Table 1: Features of 1- and 2-Gigabyte Hard Drives

	► APS Micropolis 1.2 GB ★★★★½	APS Toshiba 1.2 GB ★★★★	CMS Platinum II Enhanced 1.0 ★★★	CMS Platinum II Enhanced 2.0 ★★★★½	Dynatek HDA 1.2 GB ★★★
List price	\$1,699	\$1,499	\$3,799	\$5,569	\$3,495
Street price	\$1,699 (direct)	\$1,499 (direct)	\$2,400	\$4,480	\$3,050
Pros	Low cost per MB. Extra AC outlets. Good case design.	Low cost per MB. Extra AC outlets. Good case design.	Good case design. Switchable termination.	Good case design. Switchable termination.	Solid case design.
Cons	Few software features.	Slow. Few software features.	Few software features.	Few software features.	Few software features.
Formatted capacity	999.5 MB	1,169.9 MB	999.5 MB	1,998 MB	1,028.5 MB
Mechanism	Micropolis 2112	Toshiba MK538FB	Micropolis 2112	Micropolis 1924	Fujitsu M2266S-512
Formatter	Alliance Power Tools	Alliance Power Tools	SCSI Utility	SCSI Utility	Compass Utility
Warranty	5 years	5 years	1 year	1 year	5 years
Money-back guarantee	30 days	30 days	none	none	none
Turnaround time	48 hours	48 hours	24 hours	24 hours	48 hours
FCC Class B cert.	yes	yes	yes	yes	none visible
Company	Alliance Peripheral Systems 2900 S. 291 Hwy. Independence, MO 64057 800-233-7550 816-478-8300	Alliance Peripheral Systems 2900 S. 291 Hwy. Independence, MO 64057 800-233-7550 816-478-8300	CMS Enhancements 2722 Michelson Dr. Irvine, CA 92715 714-222-6000	CMS Enhancements 2722 Michelson Dr. Irvine, CA 92715 714-222-6000	Dynatek Automation Systems, Inc. 15 Tangiers Rd. Toronto, ON M3J 2B1 Canada 416-636-3000

	Dynatek HDA 2.0 GB ★★★	Focus 1.2 GB ★★★	FWB Hammer 1000FMF ★★★★½	► FWB Hammer 2000FMF ★★★★	► FWB SledgeHammer 2000FMF ★★★★½
List price	\$4,795	\$1,799	\$2,599	\$4,529	\$4,899
Street price	\$4,435	\$1,799 (direct)	\$2,375	\$3,600	\$4,300
Pros	Solid case design.	Small and portable. Fast.	Fast. Excellent software.	Low cost per MB. Fast. Excellent software.	Lowest cost per MB of the arrays. Fast. Excellent software.
Cons	Few software features.				
Formatted capacity	1,662.7 MB	999.5 MB	999.1 MB	2,028.7 MB	2,000.4 MB
Mechanism	Fujitsu M2265S-512	Micropolis 2112	Digital DSP3105	Seagate ST42400N	Digital DSP3105
Formatter	Compass Utility	DiskMaker 1.6.5	HDT Primer	HDT Primer	HDT Primer Pro 1.3
Warranty	5 years	5 years	2 years	2 years	2 years
Money-back guarantee	none	30 days	none	none	none
Turnaround time	48 hours	48 hours	48 hours	48 hours	48 hours
FCC Class B cert.	none visible	yes	yes	yes	yes
Company	Dynatek Automation Systems, Inc. 15 Tangiers Rd. Toronto, ON M3J 2B1 Canada 416-636-3000	Focus Enhancements 800 W. Cummings Pk. Woburn, MA 01801 800-538-8866 617-938-8088	FWB, Inc. 2040 Polk St. Ste. 215 San Francisco, CA 94109 415-474-8055	FWB, Inc. 2040 Polk St. Ste. 215 San Francisco, CA 94109 415-474-8055	FWB, Inc. 2040 Polk St. Ste. 215 San Francisco, CA 94109 415-474-8055

► *MacUser's "Bottom Line" pick*

DATA PRESS



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- Files can be transported and decompressed via software

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(800) 727-8159, (813) 884-2863, Fax (813) 888-9535**

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CIRCLE 79 ON READER SERVICE CARD.



1- and 2-Gigabyte Hard Drives

Table 1: Features of 1- and 2-Gigabyte Hard Drives, continued

	GCC UltraDrive 1000S \$\$\$	► GCC UltraDrive 2000X \$\$\$\$	Insight Power Drive 1075 \$\$\$½	Insight Power Drive 1750 \$\$\$½	La Cie Cirrus 1000Q \$\$\$
List price	\$2,349	\$4,699	\$1,899	\$2,899	\$1,449
Street price	\$2,100	\$4,225	\$1,899 (direct)	\$2,899 (direct)	\$1,449 (direct)
Pros	Fast.	Excellent case design. Switchable termination.			Switchable termination.
Cons			Internal termination. Few software features. Thin SCSI cable.	Internal termination. Few software features. Thin SCSI cable.	DIP switch for SCSI ID.
Formatted capacity	1,003.2 MB	2,028.7 MB	1,026.9 MB	1,666.5 MB	1,001.2 MB
Mechanism	Seagate ST11200N	Seagate ST42400N	Fujitsu M2266S-512	Fujitsu M2265S-512	Quantum PD1050
Formatter	Drive Manager	Drive Manager	Disk Manager Mac	Disk Manager Mac	Silverlining
Warranty	2 years	2 years	1 year	1 year	2 years
Money-back guarantee	30 days	30 days	30 days	30 days	30 days
Turnaround time	72 hours	72 hours	none	none	72 hours
FCC Class B cert.	yes	yes	yes	yes	yes
Company	GCC Technology 209 Burlington Rd. Bedford, MA 01730 800-422-7777 617-275-5800	GCC Technology 209 Burlington Rd. Bedford, MA 01730 800-422-7777 617-275-5800	Insight 1912 W. 4th St. Tempe, AZ 85281 800-927-7878 602-350-1181	Insight 1912 W. 4th St. Tempe, AZ 85281 800-927-7878 602-350-1181	La Cie Ltd. 8700 S.W. Creekside Beaverton, OR 97005 800-999-0143 503-520-9000

	La Cie Cirrus 1200Q \$\$\$	Liberty 870 MB-T \$\$\$	Liberty 1.2 GB-Q \$\$\$	► Loviél 1225 MB \$\$\$\$	MacDirect MacDirect 2400 \$\$\$\$
List price	\$1,699	\$1,899	\$2,699	\$1,799	\$2,598
Street price	\$1,699 (direct)	\$1,899 (direct)	\$2,699 (direct)	\$1,799 (direct)	\$2,598 (direct)
Pros	Switchable termination.	Small and portable. Switchable termination.	Small and portable. Switchable termination.	Low cost per MB. Good service and support.	Low cost per MB.
Cons	DIP switch for SCSI ID.	High cost per MB. Thin SCSI cable.	High cost per MB. Thin SCSI cable.	Few software features.	Thin SCSI cable.
Formatted capacity	1,167.6 MB	836.6 MB	1,167.6 MB	1,167.6 MB	1,957.6 MB
Mechanism	Quantum PD1225	Toshiba MK438FB	Quantum PD1225	Quantum PD1225	Fujitsu M2654S-512
Formatter	Silverlining	HDT Primer PE	HDT Primer PE	SCSI Director	Anubis
Warranty	2 years	2 years	2 years	5 years	5 years
Money-back guarantee	30 days	30 days	30 days	30 days	30 days
Turnaround time	72 hours	48 hours	48 hours	72 hours	24 hours
FCC Class B cert.	yes	yes	yes	yes	yes
Company	La Cie Ltd. 8700 S.W. Creekside Beaverton, OR 97005 800-999-0143 503-520-9000	Liberty Systems, Inc. 160 Saratoga Ave. Santa Clara, CA 95051 408-983-1127	Liberty Systems, Inc. 160 Saratoga Ave. Santa Clara, CA 95051 408-983-1127	Loviél Computer Corp. 5599 W. 78th St. Edina, MN 55439 800-688-3696 612-828-6880	MacDirect 60 E. Chestnut St., 145 Chicago, IL 60611 800-621-8462 312-664-8225

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IDE (AT) INTERFACE

Model Number	Formatted Capacity	Average Seek	Transfer Rate (MB/s)	5-Year Warranty
2105 A	560 MB	10 ms	5 max	Yes
2112 A	1,050 MB	10 ms	5 max	Yes



FAST SCSI-2 INTERFACE

Model Number	Formatted Capacity	Average Seek	Transfer Rate (MB/s)	5-Year Warranty
2105	560 MB	10 ms	10 max	Yes
2112	1,050 MB	10 ms	10 max	Yes

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1- and 2-Gigabyte Hard Drives

Table 1: Features of 1- and 2-Gigabyte Hard Drives, continued

	MacProducts Magic 1.2 GB \$\$\$	MacProducts Magic 2.1 GB \$\$\$	Micropolis Microdisk \$\$\$	Optima Concorde 2100 \$\$\$	Optima MiniPak 1000 \$\$\$
List price	\$1,699	\$2,799	\$4,820	\$7,990	\$3,990
Street price	\$1,699 (direct)	\$2,799 (direct)	\$3,815	\$4,300	\$2,350
Pros	Low cost per MB.	Low cost per MB.	Extra AC outlets.		Small and portable.
Cons	Thin SCSI cable.	Thin SCSI cable.	Thin SCSI cable.		
Formatted capacity	1,026.9 MB	1,810.2 MB	1,761.9 MB	2,028.6 MB	999.1 MB
Mechanism	Fujitsu M2266S-512	Seagate ST42100	Micropolis 1924	Seagate ST42400N	Digital DSP3105
Formatter	Anubis	Anubis	Microdisk	DiskMount	DiskMount
Warranty	2 years	2 years	5 years	1 year	1 year
Money-back guarantee	30 days	30 days	none	30 days	30 days
Turnaround time	none	none	7 – 10 days	24 hours	24 hours
FCC Class B cert.	none visible	none visible	none visible	yes	yes
Company	MacProducts USA, Inc. 608 W. 22nd St. Austin, TX 78795 800-622-3475 512-472-8881	MacProducts USA, Inc. 608 W. 22nd St. Austin, TX 78795 800-622-3475 512-472-8881	Micropolis 21211 Nordhoff St. Chatsworth, CA 91311 800-395-3748 818-709-3325	Optima Technology 17526 Von Karman Irvine, CA 92714 714-476-0515	Optima Technology 17526 Von Karman Irvine, CA 92714 714-476-0515

	PLI 2.1 GB Turbo \$\$\$	PLI MiniArray 2 GB (external) \$\$\$\$	PLI MiniArray 040 (internal) \$\$\$\$	Relax 960 MB \$\$\$	Saturae Edge 1000r \$\$\$½
List price	\$6,429	\$6,975	\$6,781	\$1,699	\$1,899
Street price	\$5,445	\$5,215	\$5,785	\$1,699 (direct)	\$1,899 (direct)
Pros	Switchable termination.	Fast.	Fast.	Low cost per MB. Good service and support.	Small and portable. Good service and support.
Cons	Awkward software. Shipped without formatting utility.	Awkward software.	Awkward software.	Software light on features.	Thin SCSI cable.
Formatted capacity	2,028.7 MB	2,001.1 MB	2,001.1 MB	1,028.5 MB	999.2 MB
Mechanism	Seagate ST42400N	Micropolis 2112	Digital DSP3105	Fujitsu M2266S-512	Digital DSP3105
Formatter	PLI Formatter 3.7	Quick SCSI Formatter 1.2	PLI 040 Formatter 1.1	Disk Utilities	Silhouette 1.0v
Warranty	5 years	2 years	2 years	5 years	5 years
Money-back guarantee	15 days	15 days	15 days	30 days	30 days
Turnaround time	5 days	5 days	5 days	3 days	48 hours
FCC Class B cert.	yes	yes	yes	yes	none visible
Company	Peripheral Land, Inc. 47421 Bayside Pkwy. Fremont, CA 94538 800-288-8754 510-657-2211	Peripheral Land, Inc. 47421 Bayside Pkwy. Fremont, CA 94538 800-288-8754 510-657-2211	Peripheral Land, Inc. 47421 Bayside Pkwy. Fremont, CA 94538 800-288-8754 510-657-2211	Relax Technology, Inc. 3101 Whipple Rd. Union City, CA 94587 510-471-6112	Saturae Corp. 148 Richdale Ave. Cambridge, MA 02140 800-728-8723 617-661-8166

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1- and 2-Gigabyte Hard Drives

Table 1: Features of 1- and 2-Gigabyte Hard Drives, continued

	Saturae ProLine 1910hz \$\$\$	Spin Peripherals 1.2 GB \$\$\$	Storage Dimensions MAC B-1000F \$\$\$½	Storage Dimensions MAC 1-2030F-1 \$\$\$
List price	\$2,799	\$1,549	\$4,728	\$8,953
Street price	\$2,799 (direct)	\$1,549 (direct)	\$3,180	\$6,260
Pros	Low cost per MB. Good service and support.	Low cost per MB.	Small and portable. Includes SCSI card. Good construction.	Includes SCSI card. Good construction.
Cons	Thin SCSI cable.	Thin SCSI cable.	Could not perform large block transfers.	High cost per MB. Mediocre overall speed.
Formatted capacity	1,907.9 MB	1,169.8 MB	999.2 MB	1,997.7 MB
Mechanism	Hewlett-Packard C3010	Toshiba MK538FB	Digital DSP3105	Seagate ST42400N
Formatter	Silhouette 1.0v	Spin Utilities	MacinStor Installer	MacinStor Installer
Warranty	5 years	3 years	2 years	2 years
Money-back guarantee	30 days	30 days	none	none
Turnaround time	48 hours	48 hours	48 hours	48 hours
FCC Class B cert.	none visible	yes	none visible	none visible
Company	Saturae Corp. 148 Richdale Ave. Cambridge, MA 02140 800-728-8723 617-661-8166	Spin Peripherals, Inc. 381 Elliot St. Newton, MA 02164 800-466-1200 617-965-9882	Storage Dimensions 1656 McCarthy Blvd. Milpitas, CA 95035 408-954-0710	Storage Dimensions 1656 McCarthy Blvd. Milpitas, CA 95035 408-954-0710

	Storage Dimensions SAZ-2610F2 \$\$\$½	Third Wave 1.2 GB \$\$\$½	Third Wave 2.0 GB \$\$\$½
List price	\$12,784	\$1,499	\$2,499
Street price	\$8,655	\$1,499 (direct)	\$2,499 (direct)
Pros	High sustained throughput. Good construction.	Low cost per MB.	Low cost per MB.
Cons	High cost per MB. Mediocre overall speed.	Poor documentation.	Poor documentation.
Formatted capacity	1,997.6 MB	1,028.5 MB	1,662.7 MB
Mechanism	Seagate ST41601N	Fujitsu M2266S-512	Fujitsu M2265S-512
Formatter	MacinStor Installer	HDT Primer PE	HDT Primer PE
Warranty	2 years	5 years	5 years
Money-back guarantee	none	30 days	30 days
Turnaround time	48 hours	48 hours	48 hours
FCC Class B cert.	none visible	yes	yes
Company	Storage Dimensions 1656 McCarthy Blvd. Milpitas, CA 95035 408-954-0710	Third Wave Computing 1826-B Kramer Ln. Austin, TX 78758 800-880-7555 512-832-8282	Third Wave Computing 1826-B Kramer Ln. Austin, TX 78758 800-880-7555 512-832-8282

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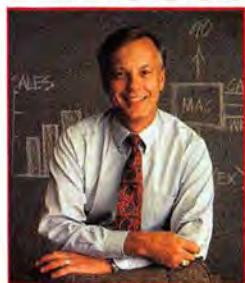


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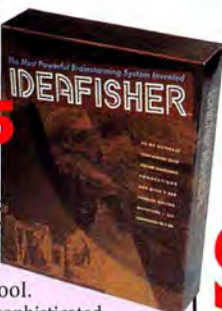
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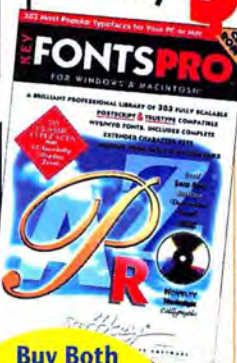
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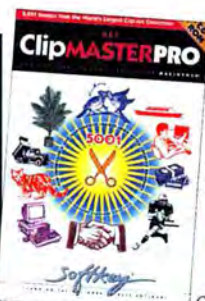
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N3350SD	DateBook 1.5	After Hours Software	\$69.95
N3363SD	DayMaker 2.0	Pastel Development	\$74.95
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N3333SD	Far Side Daily Planner 2.0c (93 upgrd.)	Amaze	\$47.95
N3359SD	FlowChart Express	Kaetron	\$79.95
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N23004SD	InTouch 2.0	Advanced Software	\$54.95
N3568SD	Inspiration	Inspiration	\$139.95
N2551SD	MacProject Pro	Clarix	\$379.95
N2633SD	Microsoft Office 3.0	Microsoft	\$469.95
N3641SD	Microsoft Project 3.0	Microsoft	\$434.95
N3893SD	Microsoft Schedule+ 1.0 5-User	Microsoft	\$119.95
N2496SD	Microsoft Works 3.0	Microsoft	\$154.95
N3303SD	Muse	Occam Research	\$449.95
N4232SD	NEC Express CD Bundle	NEC	\$359.95
N3525SD	Org Plus for Macintosh	Banner Blue	\$119.95
N3616SD	Smart Schedules 1.0	JAM Software	\$179.95
N3358SD	TopDown Flowcharter 3.1	Kaetron	\$189.95
N3351SD	TouchBase 2.0	After Hours Software	\$72.95
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N3338SD	WordPerfect Office 3.03	WordPerfect	\$79.95

Order # Product Description Publisher Price

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N3389SD	Freedom of Press 3.0.1	Custom Applications	\$229.95
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N2535SD	OmniPage 3.0 /w Spell & Draft	Caere	\$449.95
N3383SD	OmniPage Professional 2.1	Caere	\$639.95
N2499SD	PageMaker 4.2	Aldus	\$489.95
N3525SD	Personal Press 2.0	Aldus	\$94.95
N2554SD	Persuasion 2.1.2	Aldus	\$319.95
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N2871SD	Publish It Easy 3.0	Timeworks	\$109.95
N2501SD	Quark Xpress 3.1	Quark Inc.	\$529.95

Software Development

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N3010SD	Lotus 1-2-3 for Macintosh	Lotus	\$277.95
N2490SD	Microsoft Excel 4.0 for Mac	Microsoft	\$294.95

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N3404SD	DiskDoubler 3.7	Salient Software	\$47.95
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N2670SD	DiskTop 4.0	CE Software	\$59.95
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N3904SD	Star Trek Sound Clips Vol. I: Logical Coll.	Sound Source Unltd.	\$27.95
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N4245SD	Star Trek AudioClips Vol. II: Best of 2worlds	Sound Source Unltd.	\$27.95
N4242SD	Star Wars AudioClips	Sound Source Unltd.	\$27.95
N4243SD	Star Wars VisualClips	Sound Source Unltd.	\$54.95
N3522SD	Stuffit Deluxe 3.0	Aladdin	\$62.95
N2463SD	Stuffit Spacesaver 1.0	Aladdin Systems	\$32.95
N2673SD	Suitcase 2.1	FGS	\$52.95

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N2487SD	Microsoft Word 5.1	Microsoft	\$294.95
N3419SD	The American Heritage Dictionary	Wordstar	\$52.95
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N4236SD	WordPerfect 2.1 Upgrade	WordPerfect	\$64.95
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N900923	"EtherMac II-C(AUI, 10BT,BNC,64K)"	Farallon	\$198
Mac LC Cards			
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N900933	EtherMac LC(10BT)	Farallon	\$150
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N900943	"EtherMac 30i10T(10BT,AUI,16K)"	Farallon	\$181
N900945	"EtherMac 30iC(10BT,AUI,BNC,64K)"	Farallon	\$230
N901911	MacCon+ IIE64(AUI/10BT)	Asante	\$155
N901912	MacCon 3 for NuBus w/64K(AUI/BNC/10BT)	Asante	\$189
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N901921	MacCon+ 30iET 64K(AUI/10BT)	Asante	\$155
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N901932	FriendlyNet AAUI/THIN	Asante	\$79
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N29301	Turbo Mouse 4.0	Kensington	\$104
N283921	A3 Trackball	MSC	\$74
N28360	Stingray Trackball	CoStar	\$88
N279610	A3 Mouse	MSC	\$84
N283904	Little Mouse	MSC	\$73
N27791	MouseMan Mouse	Logitech	\$75
N69180	Diconix 180si Printer w/ManPower Interface Kit	Kodak	\$384
N2238	ScanMaker II Desktop Scanner	Microtek	\$899
N285228	Typist Plus Hand Scanner	Caere	\$318
N2255	ScanMan Model 32 Scanner	Logitech	\$288

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N285124	33Mhz w/68882 Math Chip	DayStar Digital	\$498
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N79119	3.5 DSDS FRMT	FUJI	\$0.75 ea.	\$0.59 ea.
N79112	3.5 DSHD	FUJI	\$1.15 ea.	\$0.99 ea.
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not that long ago, you could gauge a project team's commitment to a business proposal by the production quality of its presentation. A handwritten flip chart meant that the proposal was pulled together quickly and inexpensively. Black-and-white printed overheads signified more effort. A full-color slide show, however, indicated that someone had invested serious time, energy, and money in the presentation.

Presentation software has changed all that, making it possible to create high-impact presentations, even within a limited budget or time frame. As a result, the presentation ante has been upped. Audiences now routinely expect a healthy dose of style and glitz along with meaningful

BY SHELLEY CRYAN

Presentation Software

information. For that you need software that lets you organize your thoughts clearly, integrate text and graphics seamlessly, apply color and special effects easily, and present the results professionally.

The popularity of presentation software has spawned a crowded field that can be split into two major categories: programs that allow you to make traditional, static slide presentations and the newer applications that let you create interactive and/or animated presentations. Here, we concentrate on the slide-making programs and leave the generally higher-priced, more complex segment of the market for another article.

Among the slide makers, recent upgrades have kept the competition fierce. New features such as cross-platform compatibility, System 7 smarts (including QuickTime), fancier graphing and drawing tools, easier formatting, and updated templates have raised the stakes.

What to Look for

A good presentation has a consistent look among slides yet provides enough visual interest to keep an audience awake and engaged. Pleasing background color blends, coordinated graphs and charts, and easy-to-read type are important elements. If you plan to give your presentation while using your computer (as opposed to giving a presentation with 35mm slides), you'll also want to add some appealing transition effects between slides. Mixing in a few diagonal sweeps, vertical blinds,

and soft fades between slides can subtly help keep audience interest high.

But, of course, the most important part of your presentation is its content. A good presentation program takes charge of the production details, so you can concentrate more on what you are going to say.

The presentation programs we looked at were Microsoft's PowerPoint 3.0, Aldus' Persuasion 2.1, Symantec's MORE 3.1, and Computer Associates' CA-Cricket Presents 2.1. We also looked at StandOut, an ancient program that hasn't really changed since its introduction as ReadySetShow in 1988. Marketing rights have now returned to Manhattan Graphics, after a four-year stint with Letraset. All this changing of hands has apparently taken its toll on the product, which has been left to languish. Manhattan Graphics does not plan to revive it, opting instead to incorporate presentation capabilities into its flagship desktop-publishing product, Ready,Set,Go! 6.0. Retail copies of StandOut are still circulating, though. It suffices for the most-low-end presentations, but beyond that, we cannot recommend it.

We tested key features such as outlining ease, graphics support, design templates, graphing capabilities, and cross-platform compatibility (see Table 1) and factored these in with a program's overall feel. The programs that came out on top let you quickly pull together a professional-looking presentation based on the provided templates but also offer enough depth to let you work up snazzy

Colorwise Slides

One persistent problem that tends to plague presentations is poor color choices. When they are viewed across a dark room, color combinations that looked brilliant up close on your computer screen appear dark, subtle gradations become a murky mess, pie charts seem half-baked, and fine typographic details render your words illegible. When you're creating presentations, finding the right balance of color and contrast can be a tough challenge. That's where Pantone's ColorUP comes in.

This \$99 utility makes your color choice for you. You can choose from hundreds of predefined background colors and color palettes, each preselected for their compatibility and legibility in presentations. Each palette contains 16 colors that are assigned to such common slide elements as hierarchical titles and labels and data sets for charts and graphs (see the figure at right).

To start, specify your output medium — slide, screen, overhead transparency, or hard copy — and then choose a background color. If that color will not translate well to that

medium, ColorUP locks it out. Each background color bears a descriptive tag — for instance, Blue Curacao is deemed "cool, exotic, placid, and intriguing." Previews of sample business presentations let you see what the palette looks like in action, and you can experiment with four gradient-fill patterns.

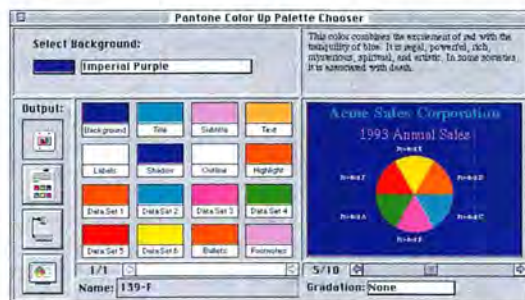
Not surprisingly, ColorUP also supports Pantone colors — the first presentation-related program to do so. Because many corporate logos are based on Pantone spot colors, this means you'll

finally be able to get it right on-screen. Don't know what a Pantone color is? Fire up ColorUP's interactive color encyclopedia, Explorer. Weighing in at a whopping 10 megabytes, it shows you the difference between spot and process colors, dithering and halftones, and other aspects of color science.

ColorUP provides palettes for five leading presentation and illustration programs, including PowerPoint, Persuasion, Illustrator, and FreeHand.

Pantone, Inc., 55 Knickerbocker Road, Moonachie, NJ 07074; 201-935-5500.

— Pamela Pfiffner



Pantone's ColorUP utility takes the guesswork out of choosing colors for presentations. Predefined palettes linked to appropriate media show the best combinations for backgrounds, titles, text, charts, and more.

custom slide designs. The heavyweights, which had superior features and excellent interfaces, were PowerPoint and Persuasion. Quite far behind were MORE and CA-Cricket Presents.

What to Expect

Each of the programs we tested allows you to produce 35mm slides, overheads, and on-screen presentations, in color or black-and-white. The majority also let you create audience handouts, speaker's notes, and a presentation outline.

Most of these programs have five types of windows, or views, in common. In one, you type or import outline-based text of your presentation. In another, you format text, draw or import illustrative graphics, and set colors and patterns. Still other windows let you sort slides and produce handouts and speaker's notes.

All four programs we reviewed use the concept of a *master slide*. Generally, anything you put on a master slide — typically a background, placeholders for text, maybe a logo — shows up on all the slides in your presentation. This approach makes formatting an entire presentation quick and easy. A collection of similar masters, or a single master, with a consistent color scheme, makes up a *template*. Most programs provide templates to help nondesigners quickly pull together designer-quality presentations.

With all these similarities, it seems as though there's little room left for variation. But that's like equating a Porsche with a Yugo, just because they're both cars.

PowerPoint 3.0

PowerPoint started out as a powerhouse five years ago. But then it sat. And sat. And sat. Its dormancy contributed to the growth of wannabes, most notably Persuasion, which for a while beat PowerPoint at its own game. Finally, last fall, version 3.0 of PowerPoint blasted onto the scene and recaptured the top of the presentation-program heap. (For a more in-depth look at PowerPoint, see the February '93 issue, page 50.) What sets PowerPoint apart is its attention to the needs of business presenters and the way it fills the gaps left by archrival Persuasion.

PowerPoint's seamless integration of views is a real time-saver. Take, for example, the WYSIWYG (what you see is what you get) Outline view. PowerPoint shows text formatting — fonts, sizes, styles — in this view. Any formats you apply in Outline view show up in



Figure 1: PowerPoint heads the pack, due to its excellent graphing capabilities, including the ability to launch Microsoft Graph and Excel. Its innovative shape tool helps even nonartists add interesting graphic elements to slides. Note the handy tool bar at the top of the screen.

Slide view, and vice versa. This helpful feature seems so simple, but only PowerPoint has it. Other programs allow you to select fonts only in Slide view, and the selected fonts fail to show up in your outline.

You access PowerPoint's impressive graphing capabilities via Microsoft Graph, a powerful stand-alone package. Graph is hot-linked to PowerPoint, meaning that you can launch it from within PowerPoint. It offers 12 categories of graphs, including area graphs, 3-D line graphs, and scatter-plots. Each category has 4 to 10 built-in formats, for a total of 84, as well as several im-

pressive options for customizing 3-D graphs.

Graph isn't the only Microsoft program you can launch from within PowerPoint. You can, for example, create a table in Microsoft Excel and embed it in a PowerPoint slide. To edit the table, simply double-click on it in PowerPoint, and Excel launches automatically.

PowerPoint's windows sport handy tool bars at the top, a familiar feature for those who have used other Microsoft applications. This tool bar saves you from schlepping to the menu when you need to perform many common tasks, such as changing font size and style and applying bullets and drop shadows.

PowerPoint lacks a Bézier-curve drawing tool (Symantec's MORE is the only one of these programs that has such a tool), but it does provide a versatile shape tool (see Figure 1). This tool is really 24 tools in 1, letting you draw perfect stars, arrows, triangles, and so on. Although you can always import graphics, it's faster to create at least the simple elements within PowerPoint itself. You can also add impact to your slides by inserting QuickTime movies.

Poor color choices can ruin well-composed slides, so nondesigners will also appreciate PowerPoint's color handling. The program has a built-in color coach, which helps you choose colors that go well together, and when you alter colors on your color palette, your graphs are automatically recolored to match.

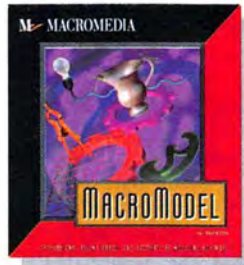
Currently, no presentation program supports Pantone spot color (see the "Colorwise Slides" sidebar), and trying to simulate specific Pantone colors or match colors for imported graphics can be cumbersome. Because you can't spec colors by using familiar RGB or CMYK percentages, you must either point to the shade you want in the Apple Color Picker or adjust HSB- or RGB-value levels (rather than percentages).

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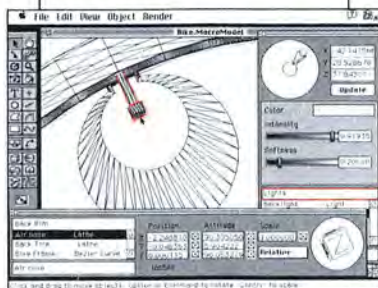
(Only Rod Serling could have made that any easier.)

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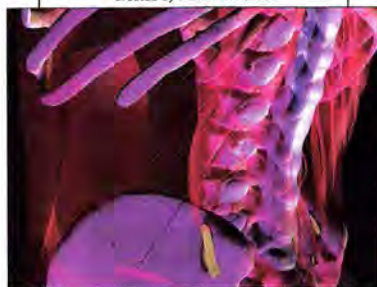


MacroModel's interface makes complex modeling easy with many of the familiar tools found in CAD and spline-based 2D illustration programs. You can even twist, bend and taper objects with the click of a mouse.



Interactive browser boxes, containing a "virtual trackball" and "virtual joystick," offer precise control of individual objects, views, light sources and materials.

Created by Donald Grahame.



MacroModel is available with RenderMan for precision modeling and photorealistic rendering. The program also supports Three-D, Swivel 3D Pro, 3D Studio, AutoCAD, Claris CAD, QuarkXPress, Illustrator, Photoshop and Director.

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Presentation Software

For presentations in which the monitor is the final output, PowerPoint offers a rich selection of 44 transition effects. It also has a tool that lets you mark up your slides as you're giving a Mac-based presentation, à la John Madden's NFL visuals: "And here's how we grabbed — bam! — a chunk of Acme's sales. Boom!"

For versatility, PowerPoint for the Mac is compatible with the Microsoft Windows version, so sharing files with a PC-based colleague is usually not a problem (see the "Sliding Cross-Platform" sidebar). The included run-time player enables you to distribute disk-based presentations freely for playback by those who do not have PowerPoint.

Persuasion 2.1

Persuasion finishes a close second in this horse race. Although it has many impressive features, it's behind PowerPoint, for a variety of reasons. Chief among these

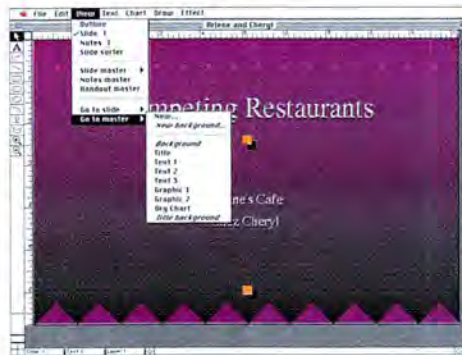


Figure 2: For maximum flexibility, Persuasion lets you create several master slides, each with different foregrounds and backgrounds. Although more complex than PowerPoint's single-master-slide approach, Persuasion's method means that you don't have to hand-adjust individual slides.

are that it lacks a WYSIWYG Outline view and that its cross-platform compatibility is not as complete as PowerPoint's (Aldus is working to improve that situation, though; see the "On the Horizon" sidebar.) Persuasion's graphing capabilities can't compete with the PowerPoint/Graph combination, and Persuasion's drawing tools are not quite as good as those of PowerPoint.

Persuasion is missing a few other niceties that are available in PowerPoint. It has no tool bar, and you can't launch other programs from within Persuasion the way you can with PowerPoint. Additionally, Persuasion lacks a color coach. Like PowerPoint,

Persuasion makes it cumbersome to simulate Pantone colors and match colors of imported graphics.

But don't let this fool you. Persuasion is a powerful program that has much to recommend it. It offers a run-time player; it has excellent integration among views; and it has System 7 smarts, including the ability to import

Sliding Cross-Platform

Need to use your Mac to edit presentations created on a PC and send them back to the PC for further refinement? Maybe you want to distribute your Mac-created disk-based presentations to people with PCs? In either case, you'll need a program with cross-platform compatibility.

PowerPoint and Persuasion promise this capability, but only PowerPoint truly delivers. That's because, unlike with Persuasion, the Mac and Windows versions of PowerPoint are based on the same core programming code. Virtually everything you create for a Mac presentation transfers well to the Windows version of PowerPoint, and vice versa.

There are exceptions. You can't play QuickTime movies in most Windows applications yet, and fonts sometimes transfer with uneven results. For best results, you need to have the same fonts installed on both computers. Even then, because of platform differences, you may get slightly different results. However, TrueType fonts, which are included with both the Mac and the PC version of PowerPoint, make the leap well.

Transferring Persuasion presentations, on the other hand, can be

trickier. Because the underlying program code is not the same, you've got to be careful about what you try to transfer. The limitations noted for PowerPoint are multiplied.

For best results, use a Persuasion AutoTemplate that is available in both Mac and PC form.

This limits you to the 37 PC-compatible templates that come with the Mac package. Even then, you'll lose some features in transfers, including subtitles, patterned lines, object shadows, some indenting, and graduated fills in polygons. Additionally, you need to save the Persuasion presentation in the Interchange File format (see the figure at left). PowerPoint doesn't require this extra step. The bottom line is that Persuasion's cross-platform compatibility is certainly better than none, but if you plan to use this feature, budget some time for some clerical cleanup work on your slides.

With either program, keep in mind that you'll need a way to transfer files between platforms — for example, a network or a PC-disk-reading utility such as Dayna's DOS Mounter or Insignia Solutions' AccessPC.

— Shelley Cryan



Persuasion lets you transfer presentations from the Mac version to the Windows version but with some limitations. Not everything transfers, and you have to save your presentation in the special Interchange File format before transferring it. Microsoft's PowerPoint doesn't require this extra step, and unlike with Persuasion, nearly everything transfers flawlessly.

Afficionados are quick to point out Persuasion's greatest structural difference from PowerPoint: master-slide handling. With each program, anything on the master shows up on each presentation slide and you can then alter individual slides as you wish. But that's where the similarity ends. Persuasion's approach is more complex, yet more flexible (see Figure 2). It breaks master slides into a master foreground and a master background, letting you create several of each. PowerPoint gives you just one master slide, and that master serves as both background and foreground. If you're creating a large presentation format, you'll prefer Persuasion's



Figure 3: MORE's origins as an outlining program are evident in its superior outlining features, such as automatic level labeling and text-style formatting. Its slide-presentation features can't compete with those of the top slide makers, however.

Persuasion provides an excellent collection of clip art and predesigned templates. Additionally, it allows you to draw on different layers, a feature PowerPoint lacks. This can make drawing a little more complicated, but it also makes it easier to select elements, especially if they're close to other items.

MORE 3.1

MORE and CA-Cricket Presents make up the second tier of presentation programs. The products in this second group lack many System 7 smarts, cross-platform compatibility, and a run-time player and are

significantly more cumbersome to use than the two category leaders, PowerPoint and Persuasion.

MORE began life as an organizer/outliner called ThinkTank, and slide-making capabilities were added later. These features have evolved enough to gain MORE a spot in any slide-maker roundup but not enough to challenge the presentation-software leaders.

Perhaps because slide making was an afterthought in the case of MORE, the program's underlying structure is downright clumsy for creating presentations. It offers only three views: outline, bullet chart, and tree chart. This assortment may be helpful for producing written reports but not for slide shows.

The tree-chart view offers impressive streamlining features for creating organization charts and general

On the Horizon

Although Microsoft's PowerPoint 3.0 came out ahead this time, new versions of Aldus' Persuasion and Computer Associates' CA-Cricket Presents should keep the competition keen.

The next version of Persuasion, slated for release later this year, will boast improvements in four key areas: interface, charting, on-screen presentations, and color handling. An improved interface sports floating palettes and prompts for text elements such as subtitles. Transferring master slides across platforms will be much easier too, according to Aldus. Persuasion's new charting module will let users create several new chart types—including true-3-D graphs—all of which can be rotated, skewed, and given perspective. Creating and editing graphs will be easier, thanks to a tightly integrated OLE (Object Linking Embedding) module.

In recognition of the impact that presentation programs have had on the market, Aldus is working to improve Persuasion's on-screen presentations. For presentations on 8-bit monitors, the color palette has been optimized for better color quality. You'll be able to navigate among Persuasion slides and frames as well as between Persuasion and other programs, and the

program will generate highlighted builds automatically. Persuasion's animations, video, and sound capabilities will be greatly improved. Pricing hadn't been set at press time.

CA-Cricket Presents III, scheduled to debut this summer, lags behind the heavyweights, but features included in this upgrade should bring the program up to par in some areas, notably with a run-time player and support for QuickTime and System 7. The new version, priced like its predecessor at \$199, will have the ability to import AIFF (audio-interchange file format) files for integrating into individual frames or entire presentations. If the soundtrack is shorter than the duration of the slide show, it will automatically loop. Transition effects between slides for on-screen presentations will sport more user-configurable options. Design and productivity enhancements will include improved layering and more hard-copy options. In the area of color, CA-Cricket Presents III will offer a wider variety of background blends, such as radial and user-defined diagonal blends, and better color dithering will make for smoother blends on 4-bit displays.

— Pamela Pfiffner

Presentation Software

hierarchical diagrams. Using these on presentation slides is awkward, though, because you need to do some unexpected cutting and pasting. Other presentation programs, although they may not offer as many automated tree-chart features, can create tree charts in slide view quite ably, and they're much easier to use.

The lack of a slide sorter for rearranging the order of your presentation is a definite drawback, as is the way MORE handles speaker's notes. You create these in a separate pop-up window that's also where you create audience handouts, so you can't have both.

MORE's presentation/graphic features, with a few notable exceptions, are average. The exceptions include a Bézier-curve drawing tool, a rare and welcome find in presentation software. MORE also lets you use two monitors — one for the presentation and the other for speaker's notes — while you're giving an on-screen presentation. And MORE lets you assign a different duration for each slide in an automatic slide show.

But these helpful features don't make up for MORE's generally cumbersome nature, subpar graphing capabilities, and decidedly unspectacular transition effects. Additionally, MORE offers neither a run-time player nor cross-platform compatibility. You can't place QuickTime movies in MORE slides, and the program doesn't support publish-and-subscribe.

Like PowerPoint's, MORE's graphing functions reside in a separate, stand-alone application — in this case, MORE Graph. However, the relationship between the main and the graphing program is not nearly as smooth as it is with Microsoft's programs: With MORE Graph, you have to copy and paste a graph into a MORE slide, whereas in PowerPoint, the graph shows up automatically. Additionally, MORE Graph itself is stuck in the Dark Ages: You have only nine graph types to choose from, and it provides you with only limited ways to customize the look of your graph. Unless your graphing needs are basic, you'll be disappointed by MORE Graph.

Not surprisingly, MORE's outlining capabilities are excellent, the best of the pack (see Figure 3). Indeed, the manual devotes 40 percent of its pages to outlining alone, giving you an indication of the real focus of this program. Intuitive keyboard and mouse shortcuts abound, such as selection of all level 1 headlines by Option-clicking on a single headline. Other superb outline features include MORE's automatic labeling (I, II, III; A, B, C; and so on) and its ability to carry styles (italic, bold, and the like), although not fonts, from an outline to a slide.

In the past, it might have made sense to develop an outline in MORE and then export it to other slide makers.

Great Graphs

Are your slides composed mostly of graphs? Then take a look at DeltaGraph Professional 2.02. Primarily a top-notch business graphing package, DeltaGraph Pro also offers serviceable slide-making features. (For a more detailed look at DeltaGraph Professional, see the June '92 issue, page 50.)

Because slide making is not DeltaGraph Pro's primary focus, don't expect all the features of a dedicated slide maker. Most important, DeltaGraph Pro lacks many automated time-savers for creating text-based slides. If you've got more than a few text slides but need the graphing sophistication DeltaGraph Pro offers, you'll be better off creating graphs with DeltaGraph Pro and then exporting them, in PICT or EPS format, for use in your favorite slide-making program.

But if you're presenting mostly graphical information, DeltaGraph Pro gives you a way to do it. You first create or import anything you want to appear on your slides, including charts, graphics, and QuickTime movies. Each of these items will be in a separate window but in the same DeltaGraph Pro file. Then you launch Slide Show and select the items you want to appear as slides.

DeltaGraph Pro offers thumbnail views of the slides in its Slide Sorter

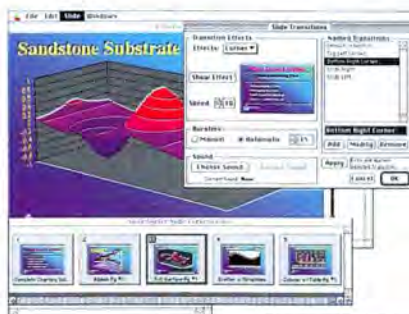
window, which is similar to what you'd find in a dedicated slide maker. There you can eyeball the entire presentation and reorder the slides. For on-screen presentations, you can also use the Slide Sorter window to select how you want each slide to transition to the next one (see the figure below). Pick among nine basic transition effects, including shutter, random squares, and window shade. In a departure from the dedicated slide makers, DeltaGraph Pro also lets you set the duration of the selected transition and attach an audio effect — a prerecorded sound resource — to the transition. A stand-alone player is included in the DeltaGraph Pro package, so you can distribute disk-based presentations to colleagues who don't have DeltaGraph Pro.

As with full-featured slide makers, you can export DeltaGraph Pro slides to a film recorder for final 35mm-slide output. You can also print handouts for your slide show.

A recently released upgrade of DeltaGraph Pro, version 2.03, offers cross-platform compatibility with the program's Windows counterpart.

DeltaPoint, Inc., 2 Harris Court, Suite B-1, Monterey, CA 93940; 800-367-4334 or 408-648-4000. \$295.

— Shelley Cryan



As a business graphing package, DeltaGraph Professional offers some impressive slide-making capabilities, such as the ability to rearrange slides and apply transition effects in its Slide Sorter window. When choosing a transition effect, you can also select duration and sound.

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Presentation Software

But as competing companies continue to improve their programs' outlining capabilities, MORE's value as a slide maker will continue to, well, slide.

CA-Cricket Presents 2.1

CA-Cricket Presents is yet another presentation program in need of an overhaul (see the "On the Horizon" sidebar). Two major structural defects plague the current version. First, it has no built-in outliner; second, poor master-page features make for weak template handling.

CA-Cricket Presents does provide an outliner — Symmetry's Acta — as a separate DA, but Acta's poor

integration with CA-Cricket Present's slide-making functions make the combination fall far short of current standards. Getting words onto your slides via an Acta outline is just plain difficult. As an attempt to remedy this situation, the program offers what it calls the AutoPresents feature, which is supposed to streamline the process. Although AutoPresents does help somewhat, in all, it's much more cumbersome than the seamless outline-to-slide relationship that PowerPoint and Persuasion provide.

CA-Cricket Presents' handling of master slides and templates leaves much to be desired (see Figure 4). The

Table 1: Features of Presentation Software

Key



	CA-Cricket Presents 2.1	MORE 3.1	Persuasion 2.1	PowerPoint 3.0
Interface				
Integration of views	■ ■ ■ ■ ■ ■ ■ ■ ■ ■	■ ■ ■ ■ ■ ■ ■ ■ ■ ■	■ ■ ■ ■ ■ ■ ■ ■ ■ ■	■ ■ ■ ■ ■ ■ ■ ■ ■ ■
Overall interface design	■ ■ ■ ■ ■ ■ ■ ■ ■ ■	■ ■ ■ ■ ■ ■ ■ ■ ■ ■	■ ■ ■ ■ ■ ■ ■ ■ ■ ■	■ ■ ■ ■ ■ ■ ■ ■ ■ ■
Organizational tools				
Outliner	■ ■ ■ ■ ■ ■ ■ ■ ■ ■	■ ■ ■ ■ ■ ■ ■ ■ ■ ■	■ ■ ■ ■ ■ ■ ■ ■ ■ ■	■ ■ ■ ■ ■ ■ ■ ■ ■ ■
Slide sorter	■ ■ ■ ■ ■ ■ ■ ■ ■ ■	■ ■ ■ ■ ■ ■ ■ ■ ■ ■	■ ■ ■ ■ ■ ■ ■ ■ ■ ■	■ ■ ■ ■ ■ ■ ■ ■ ■ ■
Automated production features				
Master-slide features	■ ■ ■ ■ ■ ■ ■ ■ ■ ■	■ ■ ■ ■ ■ ■ ■ ■ ■ ■	■ ■ ■ ■ ■ ■ ■ ■ ■ ■	■ ■ ■ ■ ■ ■ ■ ■ ■ ■
Template handling	■ ■ ■ ■ ■ ■ ■ ■ ■ ■	■ ■ ■ ■ ■ ■ ■ ■ ■ ■	■ ■ ■ ■ ■ ■ ■ ■ ■ ■	■ ■ ■ ■ ■ ■ ■ ■ ■ ■
Template quality	■ ■ ■ ■ ■ ■ ■ ■ ■ ■	■ ■ ■ ■ ■ ■ ■ ■ ■ ■	■ ■ ■ ■ ■ ■ ■ ■ ■ ■	■ ■ ■ ■ ■ ■ ■ ■ ■ ■
Slide-design tools				
Drawing tools	■ ■ ■ ■ ■ ■ ■ ■ ■ ■	■ ■ ■ ■ ■ ■ ■ ■ ■ ■	■ ■ ■ ■ ■ ■ ■ ■ ■ ■	■ ■ ■ ■ ■ ■ ■ ■ ■ ■
Color handling	■ ■ ■ ■ ■ ■ ■ ■ ■ ■	■ ■ ■ ■ ■ ■ ■ ■ ■ ■	■ ■ ■ ■ ■ ■ ■ ■ ■ ■	■ ■ ■ ■ ■ ■ ■ ■ ■ ■
Background/fill options	■ ■ ■ ■ ■ ■ ■ ■ ■ ■	■ ■ ■ ■ ■ ■ ■ ■ ■ ■	■ ■ ■ ■ ■ ■ ■ ■ ■ ■	■ ■ ■ ■ ■ ■ ■ ■ ■ ■
Clip art	■ ■ ■ ■ ■ ■ ■ ■ ■ ■	■ ■ ■ ■ ■ ■ ■ ■ ■ ■	■ ■ ■ ■ ■ ■ ■ ■ ■ ■	■ ■ ■ ■ ■ ■ ■ ■ ■ ■
Graphs and charts				
Integration with spreadsheet programs	■ ■ ■ ■ ■ ■ ■ ■ ■ ■	■ ■ ■ ■ ■ ■ ■ ■ ■ ■	■ ■ ■ ■ ■ ■ ■ ■ ■ ■	■ ■ ■ ■ ■ ■ ■ ■ ■ ■
Integration into presentation	■ ■ ■ ■ ■ ■ ■ ■ ■ ■	■ ■ ■ ■ ■ ■ ■ ■ ■ ■	■ ■ ■ ■ ■ ■ ■ ■ ■ ■	■ ■ ■ ■ ■ ■ ■ ■ ■ ■
Variety of graphs, customizing features	■ ■ ■ ■ ■ ■ ■ ■ ■ ■	■ ■ ■ ■ ■ ■ ■ ■ ■ ■	■ ■ ■ ■ ■ ■ ■ ■ ■ ■	■ ■ ■ ■ ■ ■ ■ ■ ■ ■
Text handling				
Word-processing features	■ ■ ■ ■ ■ ■ ■ ■ ■ ■	■ ■ ■ ■ ■ ■ ■ ■ ■ ■	■ ■ ■ ■ ■ ■ ■ ■ ■ ■	■ ■ ■ ■ ■ ■ ■ ■ ■ ■
Typographic features	■ ■ ■ ■ ■ ■ ■ ■ ■ ■	■ ■ ■ ■ ■ ■ ■ ■ ■ ■	■ ■ ■ ■ ■ ■ ■ ■ ■ ■	■ ■ ■ ■ ■ ■ ■ ■ ■ ■
Hard-copy options	■ ■ ■ ■ ■ ■ ■ ■ ■ ■	■ ■ ■ ■ ■ ■ ■ ■ ■ ■	■ ■ ■ ■ ■ ■ ■ ■ ■ ■	■ ■ ■ ■ ■ ■ ■ ■ ■ ■
On-screen presentations				
Transitions between slides	■ ■ ■ ■ ■ ■ ■ ■ ■ ■	■ ■ ■ ■ ■ ■ ■ ■ ■ ■	■ ■ ■ ■ ■ ■ ■ ■ ■ ■	■ ■ ■ ■ ■ ■ ■ ■ ■ ■
On-screen builds	■ ■ ■ ■ ■ ■ ■ ■ ■ ■	■ ■ ■ ■ ■ ■ ■ ■ ■ ■	■ ■ ■ ■ ■ ■ ■ ■ ■ ■	■ ■ ■ ■ ■ ■ ■ ■ ■ ■
Control	■ ■ ■ ■ ■ ■ ■ ■ ■ ■	■ ■ ■ ■ ■ ■ ■ ■ ■ ■	■ ■ ■ ■ ■ ■ ■ ■ ■ ■	■ ■ ■ ■ ■ ■ ■ ■ ■ ■
Documentation				
System-level features				
System 7-related features	■ ■ ■ ■ ■ ■ ■ ■ ■ ■	■ ■ ■ ■ ■ ■ ■ ■ ■ ■	■ ■ ■ ■ ■ ■ ■ ■ ■ ■	■ ■ ■ ■ ■ ■ ■ ■ ■ ■
Cross-platform compatibility	■ ■ ■ ■ ■ ■ ■ ■ ■ ■	■ ■ ■ ■ ■ ■ ■ ■ ■ ■	■ ■ ■ ■ ■ ■ ■ ■ ■ ■	■ ■ ■ ■ ■ ■ ■ ■ ■ ■
Data import/export	■ ■ ■ ■ ■ ■ ■ ■ ■ ■	■ ■ ■ ■ ■ ■ ■ ■ ■ ■	■ ■ ■ ■ ■ ■ ■ ■ ■ ■	■ ■ ■ ■ ■ ■ ■ ■ ■ ■
Run-time player	■ ■ ■ ■ ■ ■ ■ ■ ■ ■	■ ■ ■ ■ ■ ■ ■ ■ ■ ■	■ ■ ■ ■ ■ ■ ■ ■ ■ ■	■ ■ ■ ■ ■ ■ ■ ■ ■ ■

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Presentation Software

single available master page is really only a master background. You can't position any text placeholders on it; instead, you use it only to set a background color and graphics to appear on each slide. Provided graphics templates are less than impressive. A second type of template, used for text, is supposed to streamline text formatting in lieu of decent master-page features. You must apply a text template to each slide, unless you prefer to create the text formatting manually. You can apply text templates to a range of slides to save some time, but it's still tedious.

Eight basic graph types are available, with no-frills customizing features. Data entry is similar to that of many programs in this genre: a spreadsheetlike area into which you can type or import data. Unlike the top programs, though, CA-Cricket Presents can import spreadsheet data only in SYLK format and does not contain any facility for hot-linking to spreadsheet files.

Finally, the interface is old news. Because the program has no on-screen icons for switching among views quickly, you have to resort to the View menu every time.

On the plus side, CA-Cricket Presents lets you kern text manually. This ability to fine-tune the space between letters is crucial, because most slides consist primarily of




Figure 4: CA-Cricket Presents' background patterns are nice, but its single-master-slide approach is too limiting. The clunky interface also needs an overhaul. On the plus side, you can manually kern text; CA-Cricket Presents is the only program to offer this essential feature.

text at large sizes, in which spacing problems are most glaring. The built-in kerning pairs that type manufacturers provide aren't always sufficient, and Computer Associates was wise to include this feature. Persuasion's and PowerPoint's designers should take note.

CA-Cricket Presents' manual is clearly written and provides a good explanation of working with a service bureau to output 35mm color slides. But praising the documentation despite the program's numerous deficiencies is akin to being disappointed at a restaurant but not complaining, reasoning that even though the

food is horrible, the portions are gigantic.

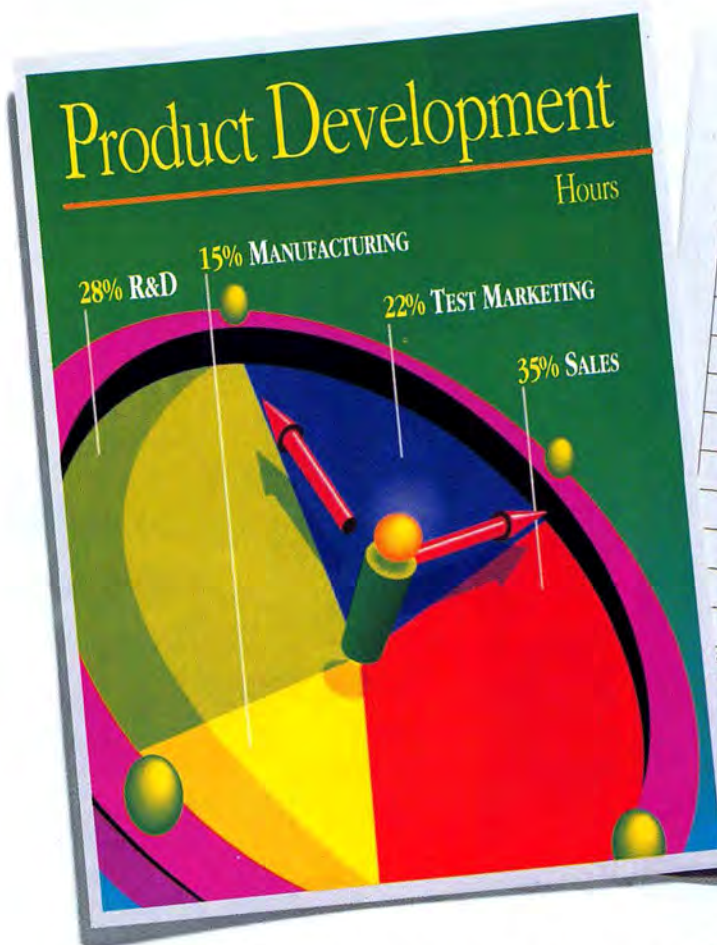
The Bottom Line

Intelligent outline and template handling as well as seamless integration among views are the key to a smoothly operating presentation program. These three areas, more than lists of features, are the entry ticket to the acceptable-program arena. PowerPoint and Persuasion are the only programs to clear that hurdle. Given its richer set of features, PowerPoint gets the nod this time. 

Shelley Cryan runs a consulting business in New York that specializes in helping companies computerize their graphic-design departments.

Table 2: Presentation Software

	CA-Cricket Presents 2.1 †††	MORE 3.1 †††	Persuasion 2.1 ††††	PowerPoint 3.0 ††††½
List price	\$199	\$395	\$495	\$495
Pros	Can kern text manually. Good documentation.	Excellent outlining and tree-chart features. Bézier-curve-drawing tool.	Multiple, flexible master slides. Serviceable cross-platform compatibility. Good integration between views. Run-time player. Top-notch System 7-related features.	WYSIWYG Outline view. Excellent graphing capabilities. Complete cross-platform compatibility. Run-time player. Seamless integration among views. Can embed data from other applications.
Cons	Awkward interface. Poor template handling. Poor graphing features.	Clumsy outline-to-slide integration. Poor graphing features.	Cumbersome color speccking.	Cannot draw on different layers.
Company	Computer Associates. One Computer Associates Plaza Islandia, NY 11788 800-225-5224 516-342-5224	Symantec Corp. 10201 Torre Ave. Cupertino, CA 95014 800-441-7234 408-253-9600	Aldus Corp. 411 First Ave. S. Seattle, WA 98104 800-333-2538 206-622-5500	Microsoft Corp. One Microsoft Way Redmond, WA 98052 800-426-9400 206-882-8080



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SILVER

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ow that color is available in every Mac family in Apple's product line — from the Color Classic to the Quadra, the Performa to the PowerBook — it may appear that monochrome and gray-scale monitors are not long for this world. But even though Apple is unlikely to introduce a new black-and-white desktop computer ever again, millions of Mac users have neither the capability, the call, nor the cash for color. Fortunately, there's still a wide selection of affordable monitors for the color-free crowd.

Built-in color has become ubiquitous in Mac computing. But if you don't need color, why pay for it?

BY OWEN W. LINZMAYER

SCREENS

Monochrome and Gray-Scale Monitors

To display color or gray-scale images, your Mac must have built-in color capability. This requirement excludes the Mac Plus, SE, and original Classic. If you have one of these models, a *monochrome* monitor, which displays images in black-and-white, is your only display-system choice. All the other Macs can drive monochrome monitors; *gray-scale* monitors, which use varying levels of intensity to achieve as many as 256 shades of gray; or *color* monitors, which use an optional video card or existing video circuitry on the Mac's motherboard.

But even if you have a color-capable Mac, you might not really need a color monitor. Sure, color makes for a friendly Finder and pretty pictures, but is it really *essential* for the work you do on your Macintosh? If you spend the majority of your day writing with a word processor, crunching numbers in a spreadsheet program, or doing other text-and-

In such cases, a color monitor would be superfluous and extravagant.

Color costs more, there's no doubt about it. Inch for inch, monochrome monitors are considerably cheaper. A relatively inexpensive 19-inch color monitor with an 8-bit-video card can easily set you back more than \$2,800 (see "Affordable Luxury: Two-Page Color Monitors," May '93, page 128). On the other hand, a similar-sized gray-scale display system might put only a \$1,000 dent in your wallet and a monochrome setup carries a street price in the neighborhood of \$700.

Not only are monochrome and gray-scale monitors less expensive but, in many respects, they also perform better and display better-looking images than color monitors do. Scrolling and screen redraw can be more than twice as fast in monochrome or gray-scale mode than in color (see the "Outliving Color" sidebar). You probably think that color is nice, but at what price? Only you can decide whether it's worth four times the cost of a noncolor monitor.

Mono a Mono

In an effort to see what really shines in the noncolor-monitor market, we gathered 23 display systems — including monitor, video-display card, and Mac-compatible cable — from 12 vendors. With such a large, diverse batch, there's something for everyone, no matter what your needs or resources. When we examined gray-scale monitors in 1989 (see "Grading the Grays," October '89, page 182), the Apple Portrait Display was the only 15-inch (full page) monitor on the market, but now there are 11 full-page monitors from which to choose, each large enough to display a full letter-sized page without scrolling. Of these, 4 are monochrome and the others are capable of displaying 256 shades of gray, sufficient for realistic gray-scale photographic retouching. And the switch-hitting Radius 15" Pivot can be



Outliving Color

Not only are monochrome monitors typically more precise than color monitors are but they also perform better. Scrolling and screen redraws can be more than twice as fast in black-and-white mode than in color. This is because displaying a single pixel as either black or white requires only 1 bit of data — a 1 or a 0 — whereas to display color, each pixel requires 8 bits of data to represent one of 256 possible colors. Even if you are scrolling through a monochrome text document, a Mac in color mode must still manipulate 8-bit data as it redraws the screen. To be fair, it should be noted that processing an 8-bit gray-scale document places as great a burden on the Mac as processing an 8-bit color document does.

— Owen Linzmayer



Sure, color makes for a friendly Finder and pretty pictures, but is it really essential for the work that you do on your Macintosh?

numbers tasks, chances are that color isn't a necessity. Nor is color always a requirement when you're shopping for a second monitor. And you certainly don't need a color monitor for a server that spends most of its time tucked away in some dusty corner.

flipped between portrait and landscape orientations, as needed.

If you crave something bigger, pick from a dozen two-page monitors, measuring 19, 20, or 21 inches diagonally. There are 4 monochrome and 8 gray-scale monitors in this category. The nice thing about these monitors is that, at 72 dpi, they let you display two 8.5-x-11-inch pages side by side at actual size, a real plus for desktop publishing. The drawback is that these machines are huge. With weights in excess of 60 pounds, a two-page monitor is far too heavy to perch atop any Mac, so you must devote roughly 2 square feet of desk space to such a behemoth. If you have more than one monitor and the monitors aren't adequately shielded, you'll need even more space to separate them so that their magnetic fields don't cause jitter.



Monochrome

Images are painted on a monochrome display by a single electron beam fired by a gun at the back of the monitor that rapidly sweeps the tube from left to right, top to bottom, many times a second. The inside of the CRT (cathode-ray tube) is coated with phosphors that glow temporarily when excited by the electron beam. If the beam is pulsed on when it hits a phosphor, the phosphor lights up and you see a white *pixel* (picture element) on-screen. Conversely, if the beam is off, the pixel is black.



Gray Scale

Gray-scale monitors work in much the same way as monochrome monitors do, but instead of relying on an electron beam that is either off or on to create black-and-white images, the strength of the beam varies to create shades of gray.



Color

Monochrome and gray-scale displays tend to look better than color ones do, because to show what appears to be a single color on-screen, a color monitor uses three electron beams that stimulate a triad of adjacent phosphors, which combine to form an individual color pixel. Properly focusing these three beams is considerably more difficult than focusing a single electron beam. As a result, monochrome and gray-scale displays usually have sharper detail, which can lessen eyestrain.

We put these display systems through their paces at ZD Labs, using a Mac LC as our primary test platform. For those cases in which, whether by chance or by design, an LC video card was not available, we used an SE/30 instead. Many of these display systems are also available with more-expensive NuBus video cards that support most Mac platforms. Although pricing may differ, performance should not.

Our technicians used a Minolta Color Analyzer CA-100 — which, despite its name, works just fine for testing monochrome and gray-scale monitors — to make objective measurements of brightness and image quality. We used another piece of hardware, a Microvision Superspot 100 System, to look for problems such as excessive jitter, poor focus, and pincushioning (see the “How We

Tested Monochrome and Gray-Scale Monitors” sidebar).

With a few minor exceptions, all the monitors performed well in our objective tests. But the numbers of the Color Analyzer and the Superspot 100 don’t provide the whole picture, so we also evaluated ease of installation, bundled software, and technical support (see the “Rating Tech Support” sidebar).

Easy Setup

As you might expect, installing a video card in a Mac LC is a piece of cake. Just unplug your Mac, pop off the top, touch the power supply to discharge static electricity, and then plug the video card in to the expansion slot. Connect the cable, apply power, and load the software, and you’re ready to rock.

But installing a video card in a

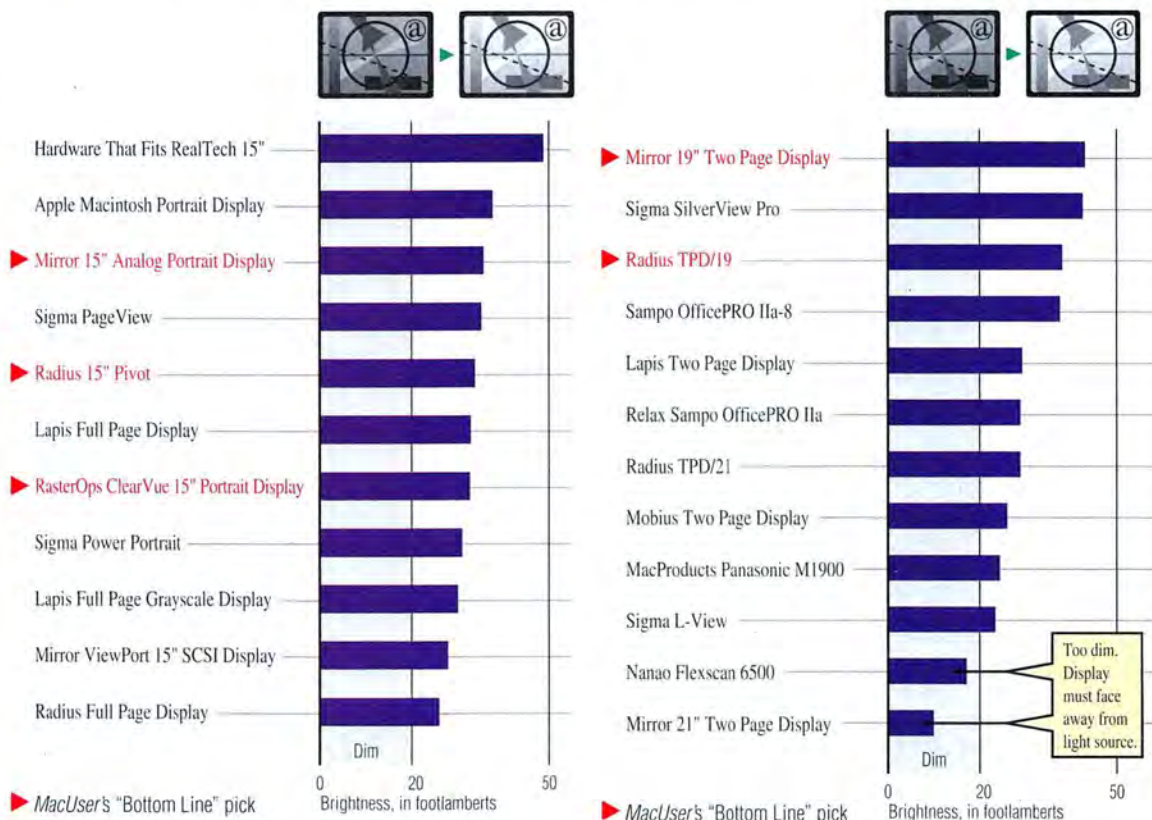
compact Mac (the Color Classic excepted) is a whole different story. We recommend that compact-Mac owners have their dealer perform the installation. If you really want to do it yourself, you need a long Torx screwdriver to remove the security screws, and a “case cracker” is helpful for separating the front and back bezels. Only Mirror included both tools with its display systems. MacProducts and Mobius were kind enough to provide Torx screwdrivers, but they did not include case crackers. None of the other vendors that submitted SE-compatible display systems provided either tool.

Once you’ve opened the case of a compact Macintosh, you’re far from home free. Our technicians had to deal with outdated, confusing, and erroneous documentation; software incompatibilities; incorrect cables;

Monochrome and Gray-Scale Monitors

MacUser Labs Figure 1: Maximum Usable Brightness

Figure 1: Brighter is not necessarily better. The more you turn up a display's brightness, the more likely the display is to go blurry. We used a Minolta Color Analyzer CA-100 to measure how bright each display could be while still maintaining a sharp focus. We compared our results for full-page and two-page monitors separately, because it's easier to get a brighter image on a smaller screen.



Full-Page Monitors:

As a monitor gets older, its phosphors also age and become dim. You can slow the aging of the phosphors by not turning the brightness control to maximum. The Hardware That Fits RealTech 15" will be the best at compensating for phosphor aging. With this monitor, you can continue turning up the brightness and still keep a sharp focus. All the full-page monitors met the adequate-brightness level of 20 footlamberts.

Two-Page Monitors:

The brightness of the Mirror 21" Two Page Display was unacceptably low in our tests. Mirror recommends this monitor mainly for use with Mac II-series display cards and Quadra on-board video. The Nanao Flexscan 6500 also had a low score, but its brightness is adequate if the display is turned away from bright light.

and defective hardware. The worst offender was the Radius Full Page Display. The documentation says that the Radius logo should appear on-screen after you've set up the system to indicate that all is well. When that didn't happen, we called our contact at Radius and were told that the card and software were compatible only

with System 7. Wrong! We finally discovered that our test monitor was defective. A replacement monitor worked fine with System 6 and 7.

Self-Brigteous

Screen brightness is largely a matter of preference: In a typical office, you may choose to set your display's

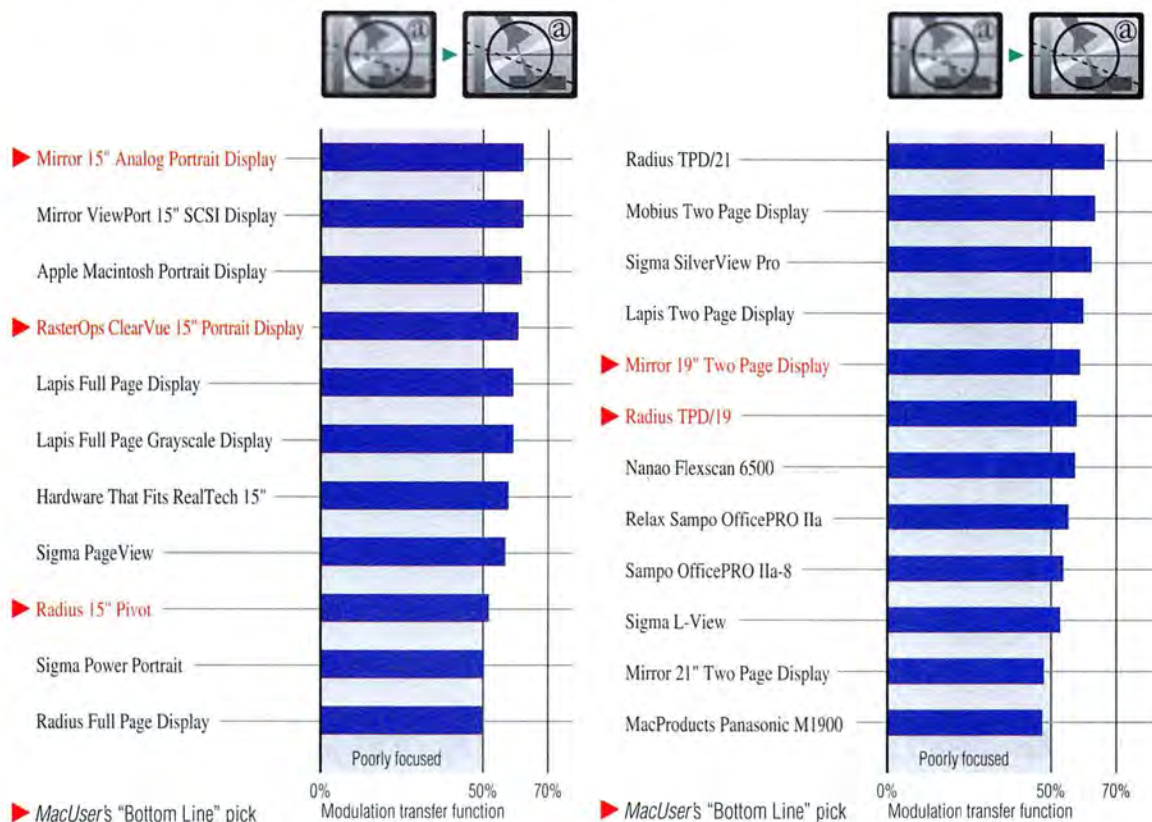
brightness level considerably below the *maximum usable brightness* (MUB). If your monitor faces a direct light source, such as a window, however, you may have to turn the dial to the maximum. The question to ask is, How bright can I make the display before the focus is affected?

A 20-footlambert brightness level



Figure 2: Sharpness

Figure 2: Using the Microvision Superspot 100 System, we measured each display's *modulation transfer function* (MTF), or ability to display sharp vertical and horizontal lines. Lines 1 pixel thick are the most difficult pattern that a display can render. On many displays, the black and white lines merge slightly, creating a soft gray area. The higher the MTF number, the better the monitor's ability to display fine detail. An MTF of 50 percent or higher is considered acceptable.



Full-Page Monitors:

All the full-page displays we tested, with the exception of those of both Radius monitors and the Sigma Power Portrait, had excellent average MTF measurements.

Two-Page Monitors:

Among the two-page displays, those of the Mirror 21" Two Page Display and the MacProducts Panasonic M1900 had MTF values that were less than 50 percent, although the results were still acceptable.

is considered acceptable under most conditions. The dimmest full-page display, the Radius Full Page Display, easily cleared this hurdle with an MUB of 26 footlamberts (see Figure 1). The Hardware That Fits RealTech 15" was way ahead of the pack, with an MUB of 49 footlamberts. Actually, turning the display up that

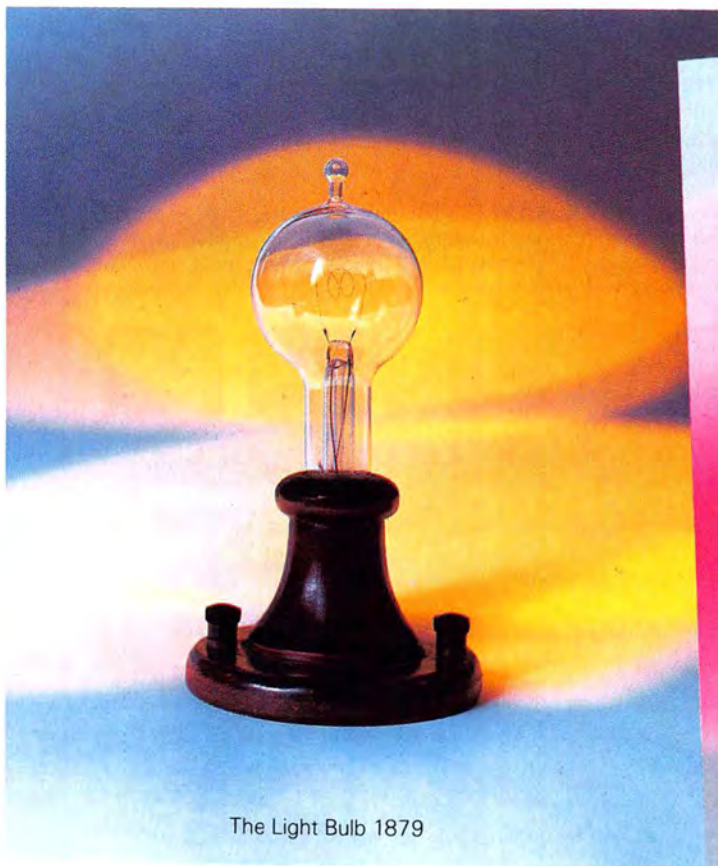
high makes it almost too bright for most situations, but it's ideal if your display faces a direct light source.

The two-page monitors had dimmer displays on average. The Mirror 19" Two Page Display, with a brightness level of 43.3 footlamberts, edged out the Sigma SilverView Pro as the brightest monitor, but Mirror's 21"

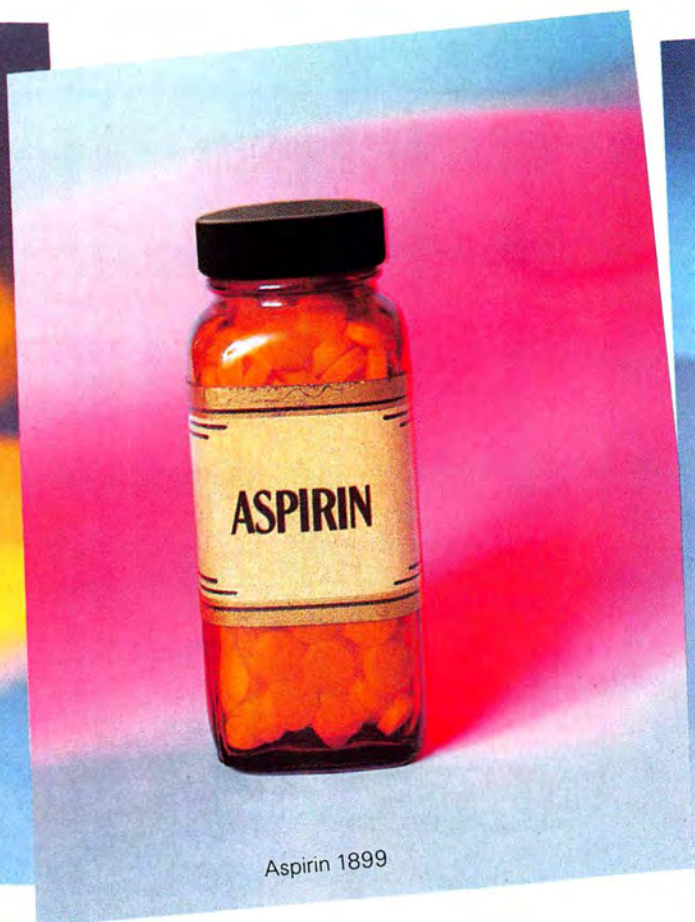
counterpart, at only 9.9 footlamberts, trailed the Nanao Flexscan 6500 for the unenviable distinction of having the dimmest display.

Avoid the Hot Spot

Buying a monitor that has a bright display but poor *spatial uniformity* is like buying a flashy car that has



The Light Bulb 1879



Aspirin 1899

The best inventions make you won

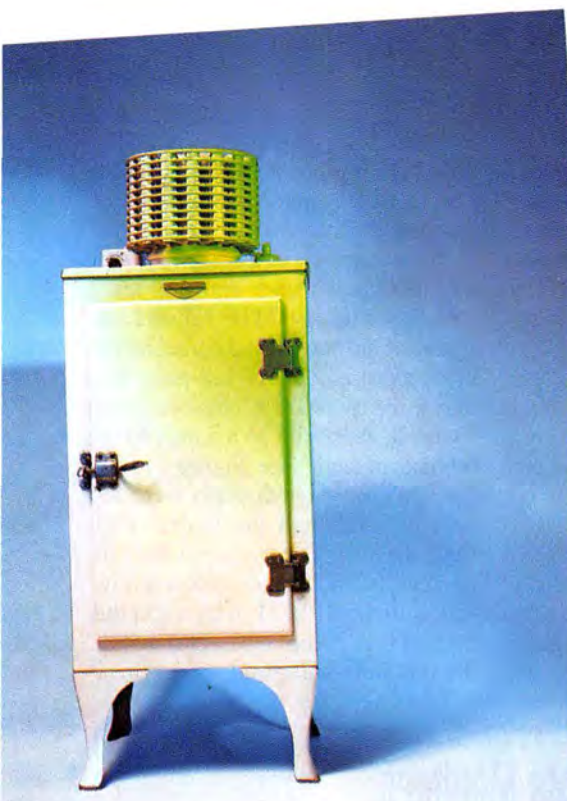
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Monochrome and Gray-Scale Monitors



Buying a monitor that has a bright display but suffers from poor spatial uniformity is like buying a flashy car that has an uneven paint job.

an uneven paint job. What you want is a consistent, or uniform, level of brightness over the entire display. All displays tend to be a bit brighter in the middle and a bit dimmer around the edges. However, none of the monitors we tested exhibited any deviations that are worth worrying about. The Mirror 21" Two Page Display had the worst score in this test, with a deviation between the center and the edges of 8.3 percent, but even that isn't noticeable to the human eye.

Sharper Image

You probably already know that a sharp display is easier to work with than a poorly focused one. To get an objective picture of sharpness, we

obtained values for each display's *modulation transfer function* (MTF). An MTF of more than 50 percent is generally considered acceptable; the higher the percentage, the better the monitor's ability to display fine detail such as hairlines and tiny text. Displays with low MTF values look blurry or unfocused and can contribute to eyestrain. Of the full-page displays, the two Mirror ones were the sharpest, each with an average MTF of 62.5 percent (see Figure 2). All the other full-page displays were acceptable, although the Radius Full Page Display fell right on the 50 percent cutoff. Radius redeemed itself with the TPD/21, which had the highest MTF (66.5 percent) of all the monitors we tested. The Mirror



How We Tested Monochrome and Gray-Scale Monitors

Under the keen eye of a Microvision Superspot 100 System sitting atop a Newport MST Series optical table, our technical staff evaluated focus- and geometry-related factors for each monitor's display. We then used a Minolta Color Analyzer CA-100 to measure brightness.

The *maximum usable brightness* (MUB) is measured in footlamberts. We measured a solid white screen displayed after adjusting for maximum sharpness. If you turn up a display's brightness to a value that's greater than the MUB, you're likely to lose sharpness.

Most displays are a little brighter at the center and a little dimmer around the edges. We determined *spatial uniformity*—how evenly a monitor maintains brightness over the whole screen—by measuring the luminance of nine areas on the display. We then calculated the percentage deviation by normalizing the standard deviation of the measurements to the average brightness.

The objective measurement of sharpness is the *modulation transfer function* (MTF). We used the Superspot 100 to ascertain

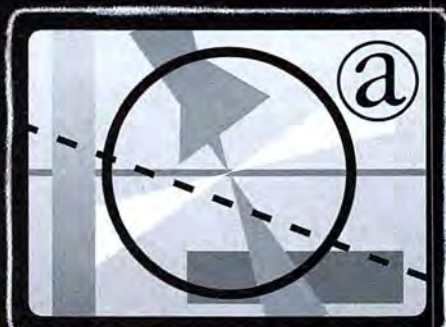
the monitor's ability to resolve from white to black, and vice versa, using a test pattern of alternating black and white lines, each 1 pixel thick. We focused in on this pattern while adjusting the display's brightness and contrast settings for maximum MTF, to achieve the brightest, sharpest image on each display.

We also measured *pincushion error*. The Superspot 100 can automatically focus on and move along a line on-screen and then calculate the line's deviation from a straight path. The maximum deviation from that path is the pincushion error.

Our jitter, swim, and drift tests provided data about the screen's stability. *Jitter* is the movement a pixel makes during half a second. *Swim* and *drift* are slower movements, measured over intervals of ten seconds and one minute, respectively. We used the Superspot 100 to measure jitter, swim, and drift at the upper left and lower right corners and at the center of the screen. For accuracy, measurements for jitter, swim, and drift are averaged over two and a half minutes.

—Stephen Chan

Ideal image



Poor modulation transfer function



21" Two Page Display and the MacProducts Panasonic M1900 turned in the poorest MTF results — 48 and 47.5 percent, respectively.

Don't Distort the Facts

You also want a display that is free from *geometric distortion*. If circles are elliptical and straight lines curved, the display suffers from *pincushioning*. On average, we found that the full-page displays were less affected by pincushioning than the two-page ones were. This is because, on the smaller monitors, the electron beams don't have to bend as far to "paint" the edges of the screen. Of all the full-page displays, the Apple Macintosh Portrait Display had the largest pincushion error, but this paled in comparison with the pincushion error of the MacProducts Panasonic M1900, the Nanao Flexscan 6500, and the Mirror 21" Two Page Display.

Finally, our tests for jitter, swim, and drift all measured how much the screen image moves. Jitter is an annoying shaking motion that can drive your eyes crazy. Swim and drift are more gradual, undulating motions that can be just as irritating. All three contribute to eyestrain and headaches. The monitors we tested showed minimal amounts of jitter, swim, and drift, none of which were noticeable to the eye.

Software Bonuses

You don't need any special software to use a monochrome or gray-scale display system, but some vendors provide utilities that make life with a large-screen monitor easier and more productive.

All of the Radius display systems come with the RadiusWare control panel, which lets you select features such as a screen saver, screen capture, enlarged menu-bar font, cursor beacon, and bit-depth changer. Mirror provides a similar collection of utilities with its display systems, but much more functional alternatives are available in the public domain.



Rating Tech Support

We contacted tech support for each of the 12 vendors represented in this report to assess how well the companies serve the people who buy their products. We made anonymous calls so that we would be treated as customers, not as the press. We noted how long it took to reach each company's tech-support staff, whether (and for how long) we were put on hold, whether we had to leave a message, and how long it took the company's representative to return our call. We asked three questions. Our questions and the correct responses were as follows:

Q. I've just set up the display system, but the menus and files appear on my Mac's internal (small) display. How do I move everything to the big display?

A. Open the Monitors control panel, drag the menu bar to the other monitor's icon, and then reboot.

Q. When I move the cursor from my standard display to the new display, I have to move it to the right, even though the new monitor is on the left. Short of physically moving the monitor to the other side of my Mac, what can I do?

A. Open the Monitors control panel, drag the monitor's icon from one side to the other, and then reboot.

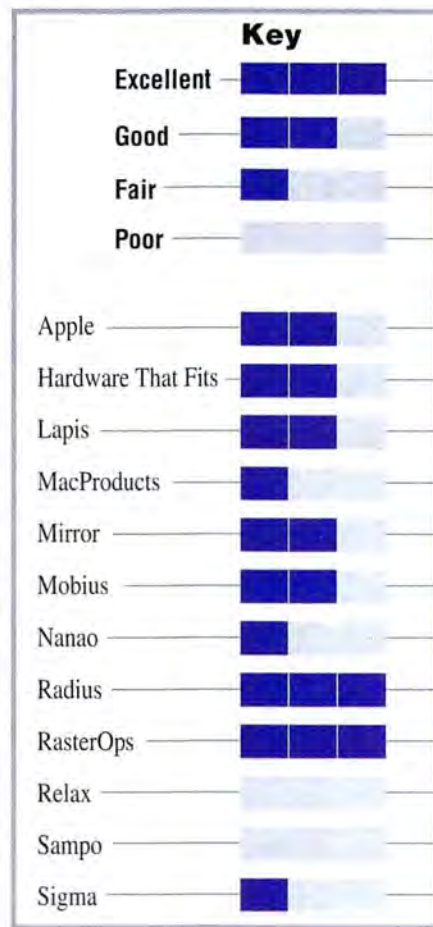
[Alternative question for MacProducts, whose cursor-dragging scenario was a little different:

Q. When I try to move the cursor from my standard display to the Panasonic M1900 display, it doesn't leave my standard Mac display.

A. With the MacProducts display system, only one display can be enabled at a time. Restart your system to allow extensions to load and to enable the Panasonic M1900 monitor.]

Q. The monitor and the video card are installed, but the image on the new monitor's display is shaky.

A. The monitor is sitting near another machine or appliance that is interfering with the monitor's magnetic field, causing the display to jitter. Repositioning the monitor should solve the problem.



The Radius control panel also has several options specifically for its Pivot that help rearrange the desktop when you switch orientation. Another Radius feature is the ability to use a compact Mac's internal screen to display a 2x to 8x magnification of a portion of the larger external monitor's display.

Sigma Designs provides a useful

feature with its 19-inch monochrome multimode L-View. At its standard resolution of 72 dpi, the L-View displays 1,024 x 768 pixels. At the touch of a hot key, the L-View switches among six modes, from 512 x 384 oversized pixels, at 36 dpi, to 1,664 x 1,200 tiny pixels, at 120 dpi. The lower dpi settings are great for presentations and reducing eyestrain,

Monochrome and Gray-Scale Monitors

► The Bottom Line

If you're in the market for a large monitor but you don't need color, we have good news. With few exceptions, you really can't go wrong buying any of the monitors tested for this report.

Of the 11 full-page display systems we tested, we liked the **Mirror 15" Analog Portrait Display** (\$549 direct) the best. Good test results, knowledgeable tech support, and a near rock-bottom price make it the best value for the money in its class.

Another strongly recommended buy is the **RasterOps ClearVue 15" Portrait Display** (\$1,048 list, \$785 street), whose results in most tests nearly matched those of the Mirror 15" Analog Portrait Display. Excellent tech support and a low street price make this display system a fine buy.

Although it costs a little more, we also recommend the **Radius 15" Pivot** (\$1,448 list, \$1,205 street) for those who want a top-rated 15-inch monitor with the unique ability to switch between portrait and landscape orientation on the fly. You can save several hundred dollars if you purchase a 1-bit monochrome

video card rather than the 8-bit gray-scale card we used for our review.

In the two-page-monitor category, we recommend the monochrome **Mirror 19" Two Page Display** (\$799 direct), the brightest monitor in the jumbo size. Not only is it free from jitter, swim, and drift but it also scored above average in all of our tests. It has a mechanically etched screen to reduce glare, and its three extra ADB (Apple Desktop Bus) ports are a real convenience. But the real kicker is a price of less than \$800 for a monitor, a video card, and a useful software bundle.

Among the large gray-scale monitors, the **Radius TPD/19** (\$1,558 list, \$1,250 street) walks off with our recommendation. Although it doesn't excel in any one particular area, slow and steady wins the race, thanks to an uneven cast of competitors. The Radius TPD/19 is a solid, all-around good performer backed by excellent tech support. It's definitely worth a slight premium.



Some affordable noncolor options for your big-screen needs: clockwise from top left, the Radius 15" Pivot, Mirror 15" Analog Portrait Display, RasterOps ClearVue 15" Portrait Display, Mirror 19" Two Page Display, and Radius TPD/19.

and the higher settings allow you to squeeze more information on-screen for extrawide spreadsheets and the like. Although the multimode feature is available on the L-View only, all the Sigma Designs monitors come with software that gives you enlarged menu fonts, pop-up menus, screen savers, enlarged cursors, and screen capture.

Aside from Sigma Designs' multimode feature, the software bundled with the current crop of monochrome and gray-scale monitors is pretty generic stuff and shouldn't influence your buying decision too heavily. It's best to stick to more-significant factors such as the test results, pricing, and tech support. We reveal our favorite monitors in the bunch in the "Bottom Line" sidebar.

Owen W. Linzmayer shamelessly recommends his book *Totally Rad Mac Programs*, regardless of the kind of monitor you own. Stephen Chan, a project leader at ZD Labs, managed the testing for this report.

Table 1 and 2 Criteria

List price — The vendor's retail price for the display system.

Street price — The average price of the display system at dealers surveyed across the U.S. in March 1993 or through mail order.

Monochrome/gray-scale — Whether the display shows images in black-and-white or in varying shades of gray.

Screen size (diagonal) — The length, diagonally, of the exposed glass face of the monitor, in inches.

Active-screen size (diagonal) — The length, diagonally, of the portion of the screen that lights up, in inches.

Max. pixel dimensions — The maximum number of dots (pixels) that can be displayed on the screen, counting horizontally and vertically.

Horizontal-scan rate — The number of lines of pixels that can be written on the screen per second, in kilohertz.

Vertical-scan rate — The rate at which the screen is redrawn from top to bottom, in hertz.

Swivel-stand area — The area the monitor stand occupies on top of your desk, in square inches.

Antiglare treatment — The coating or transparent panel on the monitor screen, designed to eliminate or diffuse reflected light.

Controls — The location of available user controls for adjusting the monitor's performance.

FCC certification — Whether the monitor has Class A or Class B certification. According to the FCC, Class A products should not be sold in the consumer market.

Cables supplied — The Mac-compatible cable included in the monitor price.

Connection options — The type of video port(s) on the back of the monitor.

Dimensions (W x D x H) — The width, depth, and height of the monitor's plastic shell, in inches.

Service location — Where you return the monitor for service: to the dealer or directly to the manufacturer.

Table 1: Features of Full-Page Monitors

	Apple Macintosh Portrait Display \$\$\$½	Hardware That Fits RealTech 15" \$\$\$½	Lapis Full Page Display \$\$\$½	Lapis Full Page Grayscale Display \$\$\$½
List price*	\$1,388	\$878	\$898	\$1,298
Street price*	\$1,135	\$878 (direct)	\$650	\$910
Pros		Good for bright environments. Best spatial uniformity.	Small pincushion error.	Small pincushion error.
Cons	Large pincushion error.	Difficult card installation.	No antiglare treatment. Difficult card installation.	No antiglare treatment. Difficult card installation.
Specifications				
Monochrome/gray-scale	gray-scale	gray-scale	monochrome	gray-scale
Tube size	15 in.	15 in.	15 in.	15 in.
Screen size (diagonal)	14.25 in.	13.75 in.	13.75 in.	13.75 in.
Active-screen size (diagonal)	13.5 in.	13.5 in.	13.5 in.	13.5 in.
Max. pixel dimensions	640 x 870 pixels @ 80 dpi	640 x 870 pixels @ 80 dpi	640 x 872 pixels @ 80 dpi	640 x 872 pixels @ 80 dpi
Horizontal-scan rate	68.85 kHz	68.85 kHz	68.85 kHz	68.85 kHz
Vertical-scan rate	75 Hz	75 Hz	75 Hz	75 Hz
Swivel stand included	no	yes	yes	yes
Swivel-stand area	NA	72 sq. in.	72.25 sq. in.	72.25 sq. in.
Monitor weight	35 lb	23.8 lb	23.8 lb	23.8 lb
Antiglare treatment	etched	silica	none	none
120/240-volt switching	auto	manual	manual	manual
Controls				
Brightness	right side	right side	front	front
Contrast	right side	back	back	back
Horizontal position	back	back	back	back
Vertical position	back	back	back	back
Horizontal size	none	none	none	none
Vertical size	back	back	back	back
Power switch	back	front	front	front
Other				
FCC certification	Class B	Class A	Class A	Class A
Cables supplied	13W3 to 15-pin	9-pin to 15-pin	9-pin to 9-pin	9-pin to 15-pin
Connection options	3 ADB ports	none	none	none
Dimensions (W x D x H)	11.5 x 14 x 15 in.	11.75 x 12.5 x 16.25 in.	12 x 13 x 16 in.	12 x 13 x 16 in.
Service location	dealer	direct	dealer or direct	dealer or direct
Warranty	1 year	1 year	1 year	1 year
Money-back guarantee	dealer option	30 days	30 days	30 days
Company				
	Apple Computer, Inc. 20525 Mariani Ave. Cupertino, CA 95014 800-776-2333 408-996-1010 408-974-6726 (fax)	Hardware That Fits 610 S. Frazier Conroe, TX 77301 800-364-3487 409-760-2400 409-539-4141 (fax)	Lapis Technologies, Inc. 1100 Marina Village Pkwy. Alameda, CA 94501 800-435-2747 510-748-1600 510-748-1645 (fax)	Lapis Technologies, Inc. 1100 Marina Village Pkwy. Alameda, CA 94501 800-435-2747 510-748-1600 510-748-1645 (fax)

*For complete system, including video card.

Monochrome and Gray-Scale Monitors

Table 1: Features of Full-Page Monitors, continued

	► Mirror 15" Analog Portrait Display ††††	Mirror ViewPort 15" SCSI Display†	► Radius 15" Pivot †††½	Radius Full Page Display †††½
List price*	\$549	\$699	\$1,448	\$1,298
Street price*	\$549 (direct)	\$699 (direct)	\$1,205	\$1,055
Pros	Least expensive. Easy to set up.	Easy to set up.	Excellent tech support. Small pincushion error. Landscape or portrait orientation.	Excellent tech support. Most stable screen.
Cons				
Specifications				
Monochrome/gray-scale	gray-scale [§]	monochrome	gray-scale	gray-scale
Tube size	15 in.	15 in.	15 in.	15 in.
Screen size (diagonal)	13.75 in.	13.75 in.	14.5 in.	14.25 in.
Active-screen size (diagonal)	13.25 in.	13.5 in.	13.75 in.	13.5 in.
Max. pixel dimensions	640 x 870 pixels @ 80 dpi	640 x 870 pixels @ 80 dpi	640 x 870 pixels @ 78 dpi	640 x 870 pixels @ 78 dpi
Horizontal-scan rate	68.85 kHz	68.85 kHz	68.9 kHz	68.9 kHz
Vertical-scan rate	75 Hz	72 Hz	75 Hz	75 Hz
Swivel stand included	yes	yes	yes	no
Swivel-stand area	72 sq. in.	72 sq. in.	155 sq. in.	NA
Monitor weight	42 lb	24 lb	35 lb	35 lb
Antiglare treatment	etched	etched	etched	etched
120/240-volt switching	manual	manual	auto	auto
Controls				
Brightness	right side	front	right side	right side
Contrast	back	back	right side	right side
Horizontal position	back	none	none	none
Vertical position	back	none	none	none
Horizontal size	none	none	none	none
Vertical size	back	none	none	none
Power switch	front	front	right side	right side
Other				
FCC certification	Class A	Class A	Class B	Class B
Cables supplied	9-pin to 15-pin	two SCSI ports to SCSI	15-pin to 15-pin mini	15-pin to 15-pin mini
Connection options	none	none	none	none
Dimensions (W x D x H)	11.75 x 12.75 x 16 in.	11.75 x 13 x 16 in.	12.3 x 15.3 x 17.8 in.	12.5 x 13.8 x 14.3 in.
Service location	direct	direct	dealer	dealer
Warranty	1 year	1 year	1 year	1 year
Money-back guarantee	30 days	30 days	dealer option	dealer option
Company				
	Mirror Technologies, Inc. 2644 Patton Rd. Roseville, MN 55113 800-654-5294 612-633-4450 612-633-3136 (fax)	Mirror Technologies, Inc. 2644 Patton Rd. Roseville, MN 55113 800-654-5294 612-633-4450 612-633-3136 (fax)	Radius, Inc. 1710 Fortune Dr. San Jose, CA 95131 800-227-2795 408-434-1010 408-434-0770 (fax)	Radius, Inc. 1710 Fortune Dr. San Jose, CA 95131 800-227-2795 408-434-1010 408-434-0770 (fax)

*For complete system, including video card.

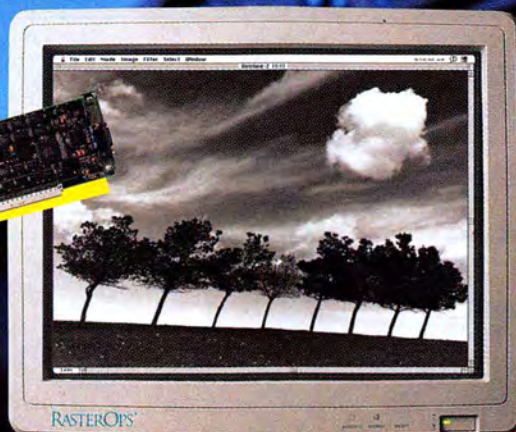
†SCSI display; no video card necessary.

§Vendor supplied monochrome card only.

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14 15 16 17 18 19 20 21 22 23

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Monochrome and Gray-Scale Monitors

Table 1: Features of Full-Page Monitors, continued

	► RasterOps ClearVue 15" Portrait Display ††††	Sigma PageView †††½	Sigma Power Portrait† †††
List price*	\$1,048	\$848	\$749
Street price*	\$785	\$755	\$675
Pros	Excellent tech support. 3-year warranty.	Easy to set up.	Easy to set up.
Cons			
Specifications			
Monochrome/gray-scale	gray-scale	monochrome	monochrome
Tube size	15 in.	15 in.	15 in.
Screen size (diagonal)	13.75 in.	14 in.	14.75 in.
Active-screen size (diagonal)	13.5 in.	13.25 in.	14.25 in.
Max. pixel dimensions	640 x 870 pixels @ 80 dpi	704 x 940 pixels @ 88 dpi ^o	704 x 940 pixels @ 88 dpi ^o
Horizontal-scan rate	75 kHz	79 kHz	78.7 kHz
Vertical-scan rate	68.85 Hz	97 Hz (@ 72 dpi)	97 Hz (@ 72 dpi)
Swivel stand included	yes	yes	yes
Swivel-stand area	72.5 sq. in.	100 sq. in.	100 sq. in.
Monitor weight	23 lb	22 lb	22 lb
Antiglare treatment	dark glass	ESF	ESF
120/240-volt switching	manual	120V only	120V only
Controls			
Brightness	right side	front	front
Contrast	back	front	front
Horizontal position	back	back	back
Vertical position	back	back	back
Horizontal size	none	none	none
Vertical size	back	none	none
Power switch	front	front	front
Other			
FCC certification	Class A	Class A	Class A
Cables supplied	9-pin to 15-pin	9-pin to 9-pin	two SCSI ports to SCSI
Connection options	none	none	none
Dimensions (W x D x H)	11.75 x 12.75 x 16 in.	11.25 x 14.25 x 16 in.	11.25 x 14.25 x 16 in.
Service location	direct or dealer	direct or dealer (try dealer first)	direct
Warranty	3 years	1 year	1 year
Money-back guarantee	dealer option	30 days	30 days
Company			
	RasterOps 2500 Walsh Ave. Santa Clara, CA 95051 800-729-2656 408-562-4200 408 562-4065 (fax)	Sigma Designs, Inc. 47900 Bayside Pkwy. Fremont, CA 94538 800-845-8086 510-770-0100 510-770-2640 (fax)	Sigma Designs, Inc. 47900 Bayside Pkwy. Fremont, CA 94538 800-845-8086 510-770-0100 510-770-2640 (fax)

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Monochrome and Gray-Scale Monitors

Table 2: Features of Two-Page Monitors

	Lapis Two Page Display \$\$\$½	MacProducts Panasonic M1900 \$\$\$½	► Mirror 19" Two Page Display \$\$\$\$½	Mirror 21" Two Page Display \$\$\$
List price*	\$1,548	\$1,037	\$799	\$1,199
Street price*	\$1,160	\$1,037 (direct)	\$799 (direct)	\$1,199 (direct)
Pros	2-year warranty.	CPU-accelerator card.	Easy to set up.	Easy to set up.
Cons	No antiglare treatment.	Large pincushion error.		Large pincushion error. Too dim. Recommended only for Mac II or Quadra series.
Specifications				
Monochrome/gray-scale	gray-scale	monochrome	monochrome	gray-scale
Tube size	19 in.	19 in.	19 in.	21 in.
Screen size (diagonal)	18.75 in.	18.75 in.	18.75 in.	20.75 in.
Active-screen size (diagonal)	17.75 in.	17.75 in.	17.75 in.	18.75 in.
Max. pixel dimensions	1,024 x 828 pixels @ 74 dpi	1,152 x 896 pixels @ 84 dpi	1,024 x 768 pixels @ 72 dpi	1,152 x 870 pixels @ 77 dpi
Horizontal-scan rate	64.5 kHz	63.95 kHz	63.92 kHz	68.68 kHz
Vertical-scan rate	75 Hz	64 Hz	78 Hz	75 Hz
Swivel stand included	yes	yes	yes	yes
Swivel-stand area	132 sq. in.	169 sq. in.	147 sq. in.	150 sq. in.
Monitor weight	55 lb	41.9 lb	53 lb	60 lb
Antiglare treatment	none	etched	etched	etched
120/240-volt switching	auto	120V only	auto	auto
Controls				
Brightness	front	front	right side	right side
Contrast	front	front	none	right side
Horizontal position	back	back	left side	left side
Vertical position	back	back	left side	left side
Horizontal size	none	back	left side	left side
Vertical size	back	back	left side	left side
Power switch	front	front	right side	right side
Other				
FCC certification	Class A	Class A	Class A	Class A
Cables supplied	BNC to 9-pin/BNC to 15-pin	3XBNC to 15-pin	9-pin to 9-pin	15-pin mini to 15-pin
Connection options	none	none	3 ADB ports	3 ADB ports
Dimensions (W x D x H)	18 x 15.5 x 18.25 in.	18.25 x 15.5 x 18.25 in.	18.5 x 15 x 17.5 in.	19.25 x 17.5 x 18.25 in.
Service location	dealer or direct	dealer or direct	direct	direct
Warranty	2 years	1 year	1 year	1 year
Money-back guarantee	30 days	30 days	30 days	30 days
Company				
	Lapis Technologies, Inc. 1100 Marina Village Pkwy. Alameda, CA 94501 800-435-2747 510-748-1600 510-748-1645 (fax)	MacProducts USA, Inc. 608 W. 22nd St. Austin, TX 78705 800-622-3475 512-472-8881 512-499-0888 (fax)	Mirror Technologies, Inc. 2644 Patton Rd. Roseville, MN 55113 800-654-5294 612-633-4450 612-633-3136 (fax)	Mirror Technologies, Inc. 2644 Patton Rd. Roseville, MN 55113 800-654-5294 612-633-4450 612-633-3136 (fax)

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Monochrome and Gray-Scale Monitors

Table 2: Features of Two-Page Monitors, continued

	Mobius Two Page Display \$\$\$½	Nanao Flexscan 6500 \$\$\$	► Radius TPD/19 \$\$\$	Radius TPD/21 \$\$\$½
List price*	\$799	\$2,398	\$1,558	\$1,858
Street price*	\$799 (direct)	\$1,760	\$1,250	\$1,500
Pros	Easy to set up. 2-year warranty.	Most stable two-page display.	Small pincushion error. Excellent tech support.	Excellent tech support.
Cons	No antiglare treatment.	Most expensive. Large pincushion error. Too dim.		
Specifications				
Monochrome/gray-scale	monochrome	gray-scale	gray-scale [§]	gray-scale [§]
Tube size	19 in.	21 in.	19 in.	21 in.
Screen size (diagonal)	18.75 in.	19.5 in.	18.75 in.	20.25 in.
Active-screen size (diagonal)	17.75 in.	19 in.	17.75 in.	19.25 in.
Max. pixel dimensions	1,024 x 826 pixels @ 75 dpi	1,152 x 872 pixels @ 75 dpi	1,152 x 882 pixels @ 82 dpi	1,152 x 882 pixels @ 74 dpi
Horizontal-scan rate	64.7 kHz	31.5 kHz, 56 – 80 kHz	65 kHz	65 kHz
Vertical-scan rate	75 Hz	55 – 90 Hz	71 Hz	71 Hz
Swivel stand included	yes	yes	yes	yes
Swivel-stand area	135 sq. in.	122 sq. in.	143 sq. in.	143 sq. in.
Monitor weight	50 lb	61.6 lb	55 lb	60 lb
Antiglare treatment	none	AR panel	none (optional add-on)	none (optional add-on)
120/240-volt switching	auto	120V only	auto	auto
Controls				
Brightness	front	front	front	front
Contrast	front	front	front	front
Horizontal position	back	front	back	none
Vertical position	back	front	back	none
Horizontal size	none	front	none	none
Vertical size	back	front	back	none
Power switch	front	front	front	front
Other				
FCC certification	Class B	Class A	Class A	Class A
Cables supplied	9-pin to 9-pin	BNC to 9-pin	BNC to 15-pin	BNC to 15-pin
Connection options	none	none	none	none
Dimensions (W x D x H)	18.5 x 15.75 x 18.5 in.	19.5 x 17.2 x 18.25 in.	18 x 16.5 x 15.5 in.	20 x 16.5 x 19.3 in.
Service location	direct	dealer	dealer	dealer
Warranty	2 years	1 year	1 year	1 year
Money-back guarantee	30 days	dealer option	dealer option	dealer option
Company				
	Mobius Technologies, Inc. 5835 Doyle St., Ste. 107 Emeryville, CA 94608 800-523-7933 510-654-0556 510-654-2834 (fax)	Nanao USA Corp. 23535 Telo Ave. Torrance, CA 90505 800-325-5202 310-325-5202 310-530-1679 (fax)	Radius, Inc. 1710 Fortune Dr. San Jose, CA 95131 800-227-2795 408-434-1010 408-434-0770 (fax)	Radius, Inc. 1710 Fortune Dr. San Jose, CA 95131 800-227-2795 408-434-1010 408-434-0770 (fax)

*For complete system, including video card.

[§]Vendor supplied monochrome card only.

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*Mac LC, Mac II or Quadra cable adapters available at no charge from your dealer.

Monochrome and Gray-Scale Monitors

Table 2: Features of Two-Page Monitors, continued

	Relax Sampo OfficePRO Ila \$\$\$	Sampo OfficePRO Ila-8 \$\$\$	Sigma L-View \$\$\$	Sigma SilverView Pro \$\$\$%
List price*	\$999	\$1,295	\$1,398	\$1,598
Street price*	\$999 (direct)	\$1,050	\$1,260	\$1,285
Pros			Small pincushion error. Easy to set up.	Small pincushion error. Easy to set up.
Cons	Poor tech support. No antiglare treatment. Difficult card installation.	Poor tech support. No antiglare treatment. Difficult card installation.		
Specifications				
Monochrome/gray-scale	gray-scale	gray-scale	monochrome	gray-scale [§]
Tube size	20 in.	20 in.	19 in.	21 in.
Screen size (diagonal)	18.5 in.	18.5 in.	18.5 in.	20.25 in.
Active-screen size (diagonal)	17.5 in.	17.5 in.	18.25 in.	19.5 in.
Max. pixel dimensions	1,024 x 768 pixels @ 72 dpi	1,024 x 768 pixels @ 72 dpi	1,664 x 1,200 pixels @ 120 dpi**	1,152 x 870 pixels @ 72 dpi
Horizontal-scan rate	64 kHz	60 kHz	75 kHz	68.68 kHz
Vertical-scan rate	75 Hz	75 Hz	60 – 92 Hz	75 Hz
Swivel stand included	yes	yes	yes	yes
Swivel-stand area	140 sq. in.	137.5 sq. in.	100 sq. in.	100 sq. in.
Monitor weight	46.2 lb	46.2 lb	46 lb	58 lb
Antiglare treatment	none	none	OCLI	OCLI
120/240-volt switching	manual	manual	120V only	120V only
Controls				
Brightness	right side	right side	front	front
Contrast	right side	right side	front	front
Horizontal position	left side	left side	back	back
Vertical position	left side	left side	back	back
Horizontal size	none	none	none	none
Vertical size	none	none	none	none
Power switch	right side	right side	right side	right side
Other				
FCC certification	Class A	Class A	Class A	Class A
Cables supplied	15-pin to BNC	15-pin to BNC	9-pin to 9-pin	15-pin to 15-pin
Connection options	none	none	none	none
Dimensions (W x D x H)	18.75 x 17 x 17.5 in.	18.75 x 17 x 17.5 in.	19 x 16.75 x 17.5 in.	19 x 17.75 x 17.5 in.
Service location	direct	direct	direct	dealer or direct
Warranty	1 year	1 year	1 year	1 year
Money-back guarantee	30 days	90 days	30 days	30 days
Company				
	Relax Technology 3101 Whipple Rd., Ste. 22 Union City, CA 94587 510-471-6112 510-471-6267 (fax)	Sampo America 5550 Peachtree Industrial Blvd. Norcross, GA 30071 404-449-6220 404-447-1109 (fax)	Sigma Designs, Inc. 47900 Bayside Pkwy. Fremont, CA 94538 800-845-8086 510-770-0100 510-770-2640 (fax)	Sigma Designs, Inc. 47900 Bayside Pkwy. Fremont, CA 94538 800-845-8086 510-770-0100 510-770-2640 (fax)

*For complete system, including video card.

[§]Vendor supplied monochrome card only.

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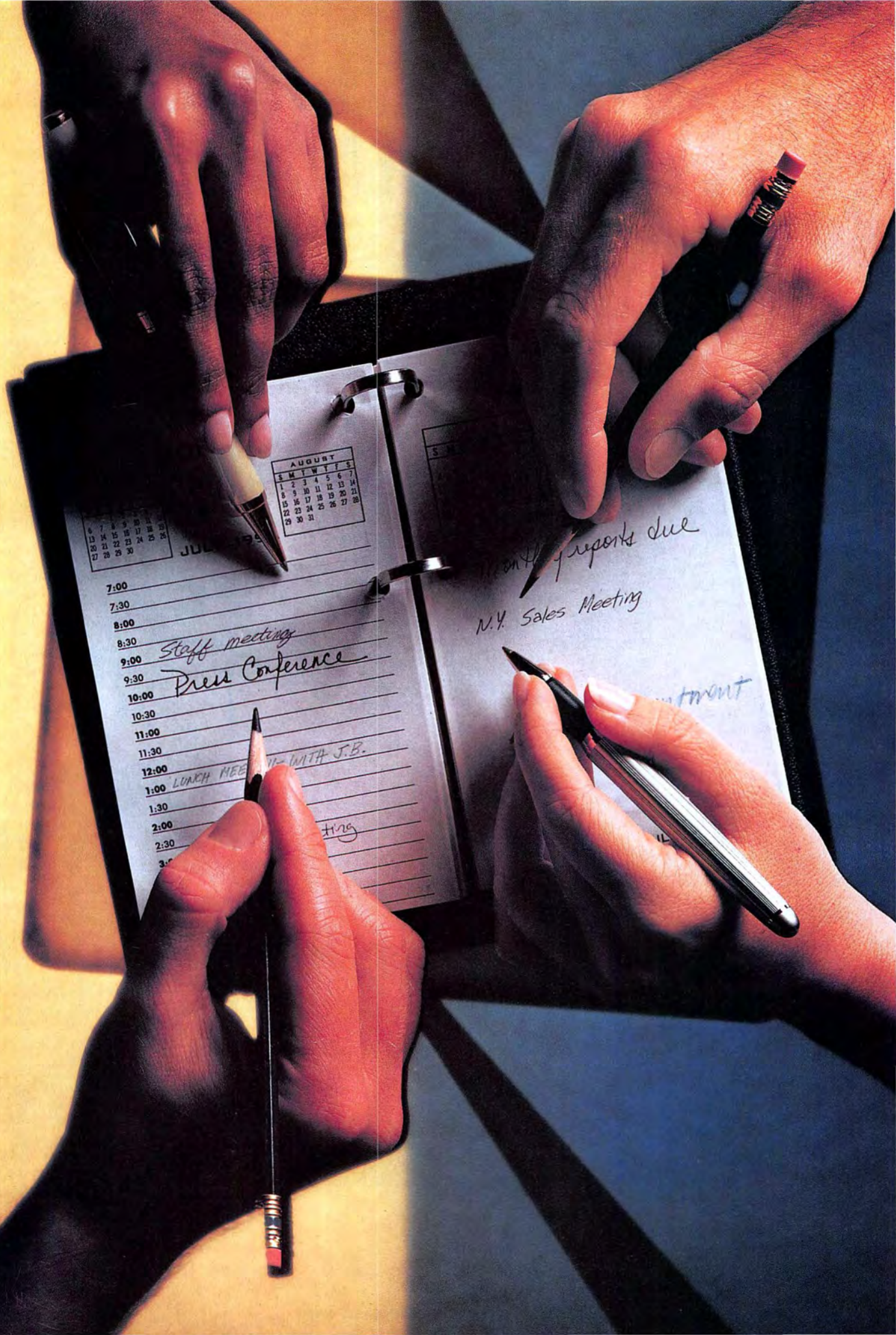
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Sharing Schedules

*t*he average work day can be divided into two unequal parts: one-third is for attending meetings and two-thirds for scheduling them. Juggling conflicting appointments, booking conference rooms, and finding that nomadic overhead projector can often be an entire day's activities. All of that running around would be eliminated if you could see everyone's calendar on your machine.

That's where group scheduling software steps in — or tries to. In the past couple of years, group scheduling software has emerged as a distinct category. Judging by the 11 programs we examined for this article, however, it's clear that this genre is nowhere near as mature as, say, word processing or desktop publishing. Of the 11 packages, we found only 4 worthy of consideration and extended discussion: Meeting Maker, the mother of all meeting-proposal programs; Microsoft Schedule+, because it piggybacks onto Microsoft Mail; Now Up-to-Date, an elegant, great-looking

Sharing a workgroups' calendars over a network can take a lot of the stress out of working together.

Group Scheduling Software

Calendar Considerations

When evaluating a group scheduler, you need to consider several important factors and features — beyond the basic issue of whether you can see someone else's calendar.

- **Is the program a calendar or a meeting proposer?**

Some programs let you share calendar information, whereas others automate the drudgery of arranging meetings.

- **How good is it as an appointment book?**

A program with good network features isn't going to be terribly helpful if it's so feeble that people don't want to trust it with their lives.

- **Does it let you schedule more than one thing at the same time?**

On occasion, you may want to book simultaneous events (such as trade-show parties). Some schedulers gracefully let you do this; others flat-out don't.

- **Does it work all the time or only when you launch it?**

Most of these programs use system extensions or control panels to monitor network scheduling activity constantly, even when you're not running the scheduler application. But not all of them do.

- **What can you see about others' schedules? What can they see about yours?**

The whole point of group schedulers is to let your workgroup share calendars, but the trick is how to share a lot of overlapping information while still presenting it clearly and maintaining some privacy.

- **Can you use proxies?**

Sometimes you'll want to let someone else — a proxy — change your schedule. Do proxies see *all* of your information or only some of it? Can you have "view only" proxies?

- **How does the program link people over a network?**

Many programs are server-based, which requires an administrator. Although most server-based programs limit your ability to take your schedule with you, because everyone's calendar resides on the server, they do make it easy to check any person's availability, whether or not that person is currently logged on to the server. Some programs that use peer-to-peer — or serverless — communications can send information only to users who are currently running the program, or who are at least currently active on the network.

- **What happens when you're not connected?**

Although PowerBooks are no longer new, it's disappointing how many of these programs, including most of the heavy hitters, assume that you never unplug your Mac and take to the road. Ideally, you should be able to disconnect from the network, edit your calendar off-line, and have the program automatically reconcile your calendar files when you reconnect.

- **How good are the program's printing options?**

Sometimes the most user-friendly computerized schedule is one that's printed on a piece of paper. Most of these programs can print bare-bones schedules; many can print attractive monthly or weekly calendars or can print on prezided forms designed to snap into your Day-Timer or similar organizer.

personal scheduler with unique network features; and WordPerfect Office's Calendar module, which offers an interesting blend of personal-appointment and meeting-proposal features. The other 7 programs, which we can't really recommend for group use, are covered in the "Secondary Events" sidebar.

Meeting Maker: Meeting Specialist

ON Technology's Meeting Maker 1.5 was the first network scheduler for the Mac, and in many ways, it's still the most full-featured. Using a bevy of dialog boxes and windows and dozens of tiny icons that convey fine shades of meaning — often none too clearly — Meeting Maker tells you more about your meetings and their current status than any other program.

Like most network schedulers, Meeting Maker is server-based. An administrator must define users, groups, and resources on a server machine (it needn't be dedicated). You can set up more than one server on a network and servers can trade information about users and their schedules, although these options are somewhat confusing. And you can't accomplish anything at all with Meeting Maker if you're not connected to your server.

When you log on to Meeting Maker, you're presented with a five-day Daily Calendar, which displays your activities and meetings as blocks on a time line (see Figure 1). Drag through a time slot, and a dialog box pops up for creating a personal appointment. You can also specify the days and hours you're available for meetings.

It's when you start scheduling meetings that the fun really begins. First, you enter a title and location for the meeting. Then you select the guests and resources, using one of the following designations for each person: required (must attend), optional (doesn't have to attend), cc:, or blind cc:. The program assigns all invitees their own mini-icon, depending on which of the four types they belong to; the appropriate icon appears next to each invitee's name on the Guests list. These icons tell you a great deal about your invitees' types (required, optional, and so on) and status (available, busy, or on vacation), provided you can remember what they mean.

Clicking on the Schedule button brings up a window with some of Meeting Maker's fancier bells and whistles. The window gives you a list of all the guests and a time line for setting the meeting's start time and duration (see Figure 2). You can click on the Auto-Pick button to find the first time and date all required guests are free to attend, but it's more fun to scroll through the composite-schedule field, which shows a time line for the selected day. As you scroll, white bars indicate times when any required or optional guest is busy (required and optional guests have their own columns in the time bar, identified by their respective icons). You can change the meeting's

time and duration by dragging and resizing its rectangle in the time line. A diagonal bar appears through the icon of any user or resource whose schedule conflicts with your meeting time.

When you send a proposal, Meeting Maker automatically warns you if any guests respond that they are busy. The program has a plethora of options for tracking responses. A dialog box alerts you when every guest has accepted a meeting or when any guest says no. Icons on the five-day view convey similar information, and if you open a proposal, still more icons next to guests' names indicate whether they've accepted, declined, or will decide later. You can also view any comments a guest has sent back about the meeting — but you can't reply. If you change a meeting you've scheduled, Meeting Maker will automatically notify all guests.

Although you can book overlapping events, Meeting Maker treats these as conflicts rather than understanding that you might actually want to schedule multiple events. You can view one conflicting event at a time but not all of them simultaneously.

Meeting Maker's proxy features are useful and flexible: You can designate any number of users as your proxies, granting them read/write or read-only access. You can also hide the contents of your appointments and to-do items from your proxies.

In addition to its daily and messaging views, Meeting Maker offers a rudimentary monthly view and a very

simple to-do list. You can print a variety of reports, and ON Technology sells special paper designed to fit into standard appointment books. You can export events to a text file or to Sharp, Hewlett-Packard, or Casio electronic organizers.

Microsoft Schedule+: Bare Basics

Schedule+ 1.0 lets users of Microsoft Mail 3.0 or later do quite a lot with just a bare-bones interface. There's a single main window for setting your schedule and viewing others', and you use the familiar Mail interface to propose, accept, and reject meetings. Unfortunately, Schedule+ is a little *too* simple: It offers no weekly or monthly views, no to-do lists, and no repeating or overlapping events, and you can't use Schedule+ at all when you're not connected to your Mail server.

Schedule+ causes little extra work for your Mail administrator. Users and groups on your server are automatically available to Schedule+ users, and if you're logged on to your Mail server, you're automatically logged on to Schedule+. The Schedule+ window includes a scrolling daily time line, buttons for selecting the year and month you want, and a small monthly calendar (see Figure 3). You enter the name of an appointment in its starting time slot (on the hour or half-hour only, and be pithy — there's not much room) and then indicate the amount of time it will take by clicking on boxes next to each half-hour segment. You can set

Table 1: Pros and Cons of Group Scheduling Software

	Pros	Cons	Ideal Users
Meeting Maker 1.5	<ul style="list-style-type: none"> Comprehensive meeting-proposal features. 	<ul style="list-style-type: none"> Fussy interface. Doesn't work off-line. Limited calendar views. 	<ul style="list-style-type: none"> Large organizations with formal meeting-tracking requirements.
Microsoft Schedule+ 1.0	<ul style="list-style-type: none"> Simple, easy-to-use interface. Layers onto Microsoft Mail. Easy-to-use meeting-proposal features. 	<ul style="list-style-type: none"> Requires Microsoft Mail. Lacks many features found in most other programs. Lacks repeating events. Doesn't work off-line. 	<ul style="list-style-type: none"> Users who already have Microsoft Mail installed.
Now Up-to-Date 2.0	<ul style="list-style-type: none"> Handsome on-screen and printed calendars. Excellent interface design. Good support for working off-line. Well-designed network event-sharing features. 	<ul style="list-style-type: none"> Lacks formal meeting-proposal and scheduling features. 	<ul style="list-style-type: none"> Small- to medium-sized businesses or workgroups. PowerBook users.
WordPerfect Office 3.0 Calendar module	<ul style="list-style-type: none"> Good meeting-proposal and network schedule-checking features. Good value. 	<ul style="list-style-type: none"> Too many windows. Complex codes for repeating events. Difficult to use off-line. Plain calendar views. Multiplatform support is difficult to implement. 	<ul style="list-style-type: none"> Users seeking an all-in-one office-automation system. Budget-conscious users.

Group Scheduling Software

Meeting Maker

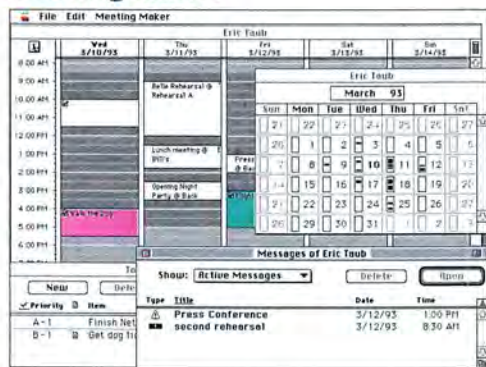


Figure 1: Meeting Maker uses lots and lots of tiny icons and has other eye-straining ways of communicating fine nuances of information. Its monthly calendar view tells you how busy you are on a given day but not *what* you'll be doing then.

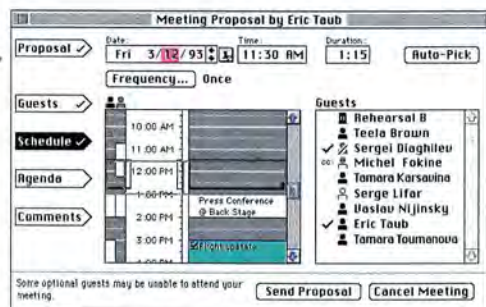


Figure 2: The Schedule part of Meeting Maker's Meeting Proposal window shows you who's busy when by putting a slash through the busy person's mini-icon. The outline icons mean something different from the solid icons, but it's up to you to remember what that difference is.

simple alarms, and you can use a notes field to enter private comments about a day's activities.

Schedule+ includes a scrolling list of the users on your local Mail server, which you can use to view another user's schedule (to see schedules of users on remote servers, you must select their names from a dialog box). Check the name of a user, and you'll see that person's schedule. Check several users' names, and you'll see gray bars drawn through the times when one or more of those users is busy. To propose a meeting, you check the names of the people you want to invite and select a time that's free on everyone's schedule. When you want to send a meeting request, Schedule+ opens a special Mail form, addressed to the people you've checked and indicating the times you've selected. Your recipients receive your proposal as they would any other Mail message,

Microsoft Schedule+



Figure 3: Microsoft Schedule+ manages to squeeze a lot into its spare main window. This window lets you examine and set your own schedule and quickly see when selected users are busy or free, making it easy to figure out when all your invitees will be available to attend meetings.

and they can automatically book the proposed meeting into their own schedules or view their schedules first to check the meeting's day and time. If you try to book a meeting that conflicts with an existing appointment, Schedule+ will ask you if you want to replace the existing appointment.

There's no automatic notification of who plans to attend your meeting, however. You have to rely on the people you invite to RSVP, or you can examine their individual schedules.

You can establish resource schedules by having your Mail administrator set up resources as users (set up an account for the conference room, for example). Schedule+'s proxy features let you easily log on to one account's Schedule+ file without logging off of your own Mail account, so you can send a meeting request to several people *and* to the conference room and then log on to the conference room's schedule to book the room.

Schedule+'s printing options are spare. You can print a day, week, month, or whatever range of dates you'd like on a single page. You can't customize the predesigned form, however, so you may slice off appointments if you print in other than the daily view.

Just as Mail's server-to-server communications features make it easy to send messages to remote users, Schedule+ lets you check schedules and book meetings with remote users.

Now Up-to-Date: Innovative Beauty

When it comes to interface design, Now Software's Now Up-to-Date 2.0 is the class act of all network schedulers. But NUD's focus is on maintaining personal and group calendars. It has no meeting-proposal and -acceptance

Now Up-to-Date



Figure 4: Now Up-to-Date's multiday view makes it easy to scan your schedule—including overlapping events. NUD's unique Category approach lets you style and color different types of events, enabling you to quickly distinguish your events from those of other users on the same calendar.

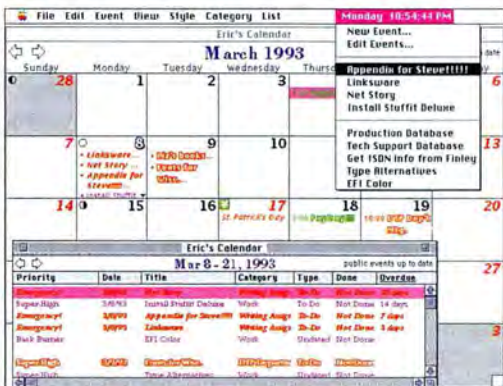


Figure 5: Now Up-to-Date doesn't include meeting-proposal features, but it does offer a superb interface. Here you can see how appointments and reminders in your main NUD file appear in the calendar and list views as well as in the Reminder menu attached to the menu-bar clock.

features. Not that NUD can't be used to schedule meetings, but it requires all users to check for meetings and adjust their schedules to accommodate them.

NUD just looks and feels right. You can design multiple custom monthly and weekly calendars that look like real calendars on-screen and that print equally well. And NUD's design is an elegant combination of attractiveness and information (see Figure 4).

NUD lets you create many kinds of calendar items: holidays, special events, appointments, dated and undated to-dos, Post-it-type notes, multiday banners, and graphic elements. You can create any number of categories to which you can assign your events—personal, business, travel, project-related, and so on—and you can assign colors and type styles to the events in each category. You can also define sets that display only the

WordPerfect Office Calendar module

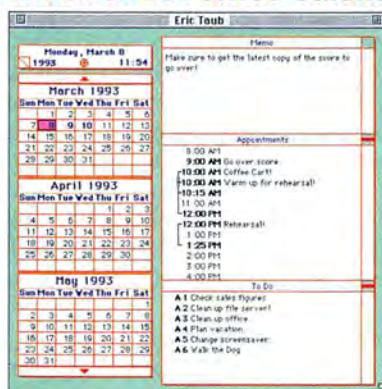


Figure 6: WordPerfect Office Calendar's daily window is effective, but it's almost as spare as that of Schedule+. Using Calendar's list view isn't the most intuitive way to view a schedule, but it does let you see overlapping events.

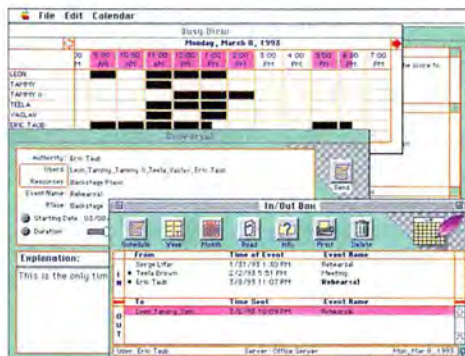


Figure 7: Scheduling a meeting in Calendar involves a slew of windows: an In/Out Box; an E-mail-like meeting proposal; and, if you need it, a Busy View, which charts when the meeting's invitees are busy.

categories you specify, enabling you to quickly switch from viewing business-related categories only to viewing business and personal ones, for example. NUD gives you many ways of viewing your schedule, as well—from yearly, monthly, and weekly views to daily and multiday time lines to wonderfully customizable list views (see Figure 5).

NUD uses a calendar file that resides on your own Mac and contains your entire schedule, so if you go on the road, you can take your calendar file with you and view and edit it whenever necessary. Moreover, NUD doesn't create a separate file for alarms. You simply tell the Reminder control panel (a successor to Now Utilities' AlarmsClock) to look for alarms within your calendar file, and Reminder notifies you by means of a dialog box or notes in your menu bar.

Group Scheduling Software

NUD takes a unique approach to server use. You don't share your calendar file or use E-mail to send appointments but rather create public categories of events, which then reside on the server. NUD users on your network can add this category to their calendar files. Once you access a public category, its events become incorporated into your calendar file and any alarms specified in the public events are automatically incorporated by Reminder. If you have write access, you can change any event in a public category. At intervals you specify, NUD looks to the server to see if anyone else has made changes to a public category and updates your calendar file as necessary.

If you take your calendar file off the network — on a floppy disk or PowerBook, for example — you can make changes to public categories; whenever you reconnect to the server, either by docking your PowerBook or via AppleTalk Remote Access, NUD automatically updates both your own calendar file and the server version, if necessary. If, when you reconnect, NUD discovers that you've modified a public event that someone else has also modified, it gives you the option of deleting your modified event or saving it to an Unreconciled Events category, so that you can consult with the other concerned parties.

NUD supports a great variety of print formats and

paper sizes. Because you can customize NUD's list views, printouts of these views are extremely useful if you want to see only specific fields of information or only certain types of events — including comments NUD doesn't print in other views. You can also export information to a Sharp Wizard electronic organizer.

WordPerfect Office: All-in-One

As a group scheduler, WordPerfect Office 3.0's Calendar module lies somewhere between Schedule+ and Meeting Maker. Like Schedule+, WordPerfect Office Calendar is mail-based. In fact, Calendar is one of four DAs that make up Office; there's also E-mail, a database program, and a notepad. Calendar's scheduling and meeting-proposal features are more sophisticated than those of Schedule+, but nowhere near the level of Meeting Maker's. Calendar sometimes appears less than the sum of its parts, however, because its attractive features are often offset by WordPerfect's awkward interface.

Calendar is server-based and supports multiple servers that can communicate much more easily than Meeting Maker's servers can. As with Meeting Maker, Calendar users and resources live on its server, but Calendar's resource options aren't as extensive. Although you must be logged on to the server to check others' schedules and send and receive meeting proposals, you can use the Office Calendar module when you're off-line. However, you have to use some care in managing your data files, because Calendar doesn't automatically reconcile conflicting information on the server and your local Mac, and it's all too possible to wipe out information you want to preserve.

Calendar uses a sparse scheduling window. On the left are two (or three, if you have a large monitor) small monthly calendars (see Figure 6). On the right, you see a three-part box into which you can enter a memo for the day, appointments, and to-do items. You enter appointments by simply typing next to a displayed time, or you can use a simple dialog box to specify exact starting and ending times and alarm options. You can set up overlapping appointments, which Calendar does a tolerable job of indicating, and you can enter very simple to-do items and prioritize them. Clicking next to a to-do item marks it as done; Calendar automatically carries over any undone to-dos to the next day.

Calendar also has bare-bones weekly and monthly views that show your appointments for any given day. You can resize these windows and open an appointment's dialog box by double-clicking on it, but you have no other formatting or display options.

Calendar has powerful functions for scheduling repeating appointments, but to take advantage of them, you must create formulas by using a baffling language to specify when you want events to repeat. WordPerfect tries to make formula creation a bit more user-friendly

On the Horizon

TeamAgenda, from MacVONK (the distributor of Ragtime), arrived too late to be included in this article. The program holds a lot of promise, although it may be a bit overdesigned. TeamAgenda keeps copies of your personal-schedule file on both a network server and on your own Mac, so you can disconnect from the network and automatically synchronize the two files when you reconnect. The program's networking features seem especially robust and comprehensive — from meeting proposals and scheduling to proxies and group holiday calendars.

WordPerfect Office 4.0, due out sometime this summer, promises to address the program's confusing multiplicity of windows with a more integrated design. It will offer better calendar views and (finally!) a method of scheduling repeating events that avoids the baffling command language required by WordPerfect Office 3.0 Calendar.

Pastel Development has announced a network scheduling module for its DayMaker 2.0 personal information manager. This module promises, by means of serverless, distributed scheduling, to let every DayMaker user on a network see the schedules of other DayMaker users who've made their schedules public.

Also, by the time you read this, ON Technology's new Meeting Maker XP should be available. This major upgrade lets you edit your schedule off-line and automatically reconcile it when you reconnect to your network. XP has a real monthly calendar view and lets you track personal and group to-do items. It also supports multiplatform scheduling between Windows PCs and Macs on the same network.

Secondary Events

Many programs on the market offer some degree of network scheduling capabilities but don't quite make the grade.

True Multiuser Programs

CalScan **\$\$\$** Version 3.0 of RBC's CalScan has just about every feature you could want in a scheduling program: multiple views, proxies, appointment proposals, and conflict resolution. And CalScan is cross-platform: It's just as cumbersome on Macs as it is on PCs. CalScan is built on a run-time version of FoxBASE, which may explain its interface — a cluttered collection of dialog boxes with endless radio buttons and check boxes, plus just plain ugly schedule and appointment lists. Worse yet, CalScan has no alarms function at all. With its overly elaborate procedures and stilted terminology, CalScan is a program only a bureaucrat could love. Make that *like*.

RBC, Inc., Two Colonial Place, 2101 Wilson Blvd., Ste. 801, Arlington, VA 22201; 703-243-9550 or 703-243-7854 (fax). Version 3.0. \$399, five users; \$499, ten users.

Connections **\$\$\$** Concentrix Technology's Connections 2.1 has more features for keeping track of your life than you can shake a stick at. It has well-thought-out, server-based group-calendar features that let you define proxies, check others' schedules, and easily reconcile your personal calendar file with the network one. Unfortunately, Connections can't overcome the fact that it's a series of linked HyperCard stacks. Its displays look clumsy, and the program is painfully slow — even on a Quadra 950.

Concentrix Technology, Inc., 1875 S. Grant St., Ste. 760, San Mateo, CA 94402; 415-358-8600 or 415-358-9742 (fax). Version 2.1. \$199, single user.

Smart Schedules **\$\$\$** Smart Schedules 1.0, from the people who brought you Smart Alarms, seems promising until you use it. It's not server-based, so you can take your schedule with you, but there's no system extension: You have to keep Smart Schedules running constantly if you want to see your alarms or have others book meetings with you. Furthermore, it's burdened by a fussy, rococo interface (see figure at top).

JAM Software, 843 W. Main St., Meriden, CT 06450; 203-630-0055 or 203-686-1900 (fax). Version 1.0. \$260, single user; \$675, five users; \$1,200, ten users.

Multiuser Wannabes

Active Memory **\$\$\$** ASD Software's Active Memory 2.0 is more of a to-do list on steroids. It uses only a single, spreadsheetlike listing of upcoming tasks, deadlines, priorities, and related information (see figure at bottom).

When you exchange events with other Active Memory users, each person can accept them for their events file or reject them, and Active Memory can alert you whenever you receive an event. Parts of Active Memory's design are quite elegant, but its lack of true calendar-style views makes the program less than ideal for people who need to plan their schedules over long periods of time.

ASD Software, Inc., 4650 Arrow Hwy., Ste. E6, Montclair, CA 91763; 909-624-2594 or 909-624-9574 (fax). Version 2.0. \$199, single user; \$499, five users; \$899, ten users.

DateBook **\$\$\$** DateBook 1.5, from After Hours Software, is a much better personal scheduler than it is a group scheduler. DateBook lets you share and edit a calendar file on a network

volume, but you can't have more than one file open at once: You can look at your personal schedule or your group's schedule but not at both at the same time. There are no proxy or meeting-proposal features. (DateBook Pro, which will replace DateBook, has the same multiuser limitations.)

After Hours Software, 5990 Sepulveda Blvd., Ste. 240, Van Nuys, CA 91411; 818-780-2220 or 818-780-2666 (fax). Version 1.5. \$125.

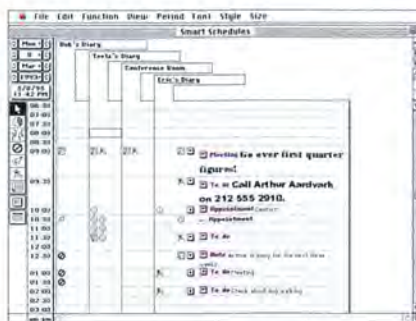
Easy Alarms **\$\$\$** Easy Alarms 2.0.4, from Essential Software, is a deceptively simple calendar program with promising — and potentially dangerous — network features. You can share and edit multiple calendar files and send alarms directly to other users (if they're logged on to the network). The sent alarms go directly into designated calendars, but recipients aren't notified when this has happened.

That's the danger. With Easy Alarms' powerful scripting language, it's all too easy for someone to create and send an alarm that, when triggered, will instantly shut down your Mac! (Version 2.1 of the program, now shipping, is functionally identical to version 2.0.4 but adds support for X10 home-automation devices.)

Essential Software, 28 Mulford Ave., P.O. Box 402, Staatsburg, NY 12580; 914-889-8365. Version 2.0.4. \$99, single user; \$299, five users; \$499, ten users.

Smart Alarms **\$\$\$** Version 3.1 of JAM's venerable Smart Alarms comes with a DA called Appointment Diary, available in a multiuser, networkable configuration, which is cumbersome to install and use. Although many users can have the same networked diary file open at once, only the first person who opened it can actually write changes to it. Don't forget to close your workgroup's file before going to lunch.

JAM Software, 843 W. Main St., Meriden, CT 06450; 203-630-0055 or 203-686-1900 (fax). Version 3.1. \$90, single user; \$170, four users; \$299, eight users.



With tools and buttons galore, Smart Schedules takes its job very seriously. Unfortunately, its oddball "coat hanger" views of each diary's (that is, calendar's) events make Smart Schedules fussy and overdesigned, and its alarms work only when the program is running.



Although it offers excellent event-tracking capabilities, Active Memory doesn't have a useful monthly or weekly calendar view. The small monthly calendar at the lower right corner of this screen is the closest Active Memory comes to looking like a calendar program.

Group Scheduling Software

by providing a dialog box with pop-up menus for accessing formula commands.

To schedule appointments for networked users, you must use still more windows (see Figure 7). First, there's a window for scheduling the event, where you enter the names of the users and the resources necessary for the meeting. (If you're connected to a server, you can call up lists of users, groups, and resources on your server or on other servers your server is connected to.) You also enter the name of the event and its location and specify the starting and ending times. The program provides an Explanations text field, in which you can enter any other information.

If you're connected to your server, Calendar's handy Busy View (yes, another window) shows you, hour by hour, when the users to whom you've addressed the request are free or busy and when the needed resources are available. It draws black bars through the hours when invitees are busy and gray ones through the times when they have pending appointments. Assuming that you do find a time when all the people and resources you want are free, you double-click on the time to automatically enter it into the event-scheduling window. Clicking on the Send button sends the request.

When you receive a meeting request, Calendar pops up a notification message. To read and respond to a request, you go to the In half of Calendar's In/Out Box (still another window) and open the request. The event-request window lets you accept or reject a request. If you accept, the meeting time is automatically placed into your calendar file. You can also see who else has already accepted or declined, along with their reasons. Requests you've sent show up in the Out half of the In/Out Box. For any request you've sent, you can see a list of who's accepted or rejected, and their reasons. If your invitees are dragging their feet about getting back to you, you can renotify them of the meeting.

Calendar offers only two limited, predefined print formats. However, it does let you design your own formats, so if you don't mind running some trees through your laser printer, you'll eventually come up with something that fits your needs.


Pick of the Month

It's difficult to pick a clear winner here, because no single program has all the features we find desirable in a network scheduler. Meeting Maker leaves much to be desired as a personal scheduler, but it is the master of proposing meetings and tracking responses, especially in large, formal workgroups. Its level of detail may tell you even more than you need to know.

Microsoft Schedule+ lacks features that most other scheduling programs have. The lack of repeating events is a major shortcoming, and the program is also minus weekly and monthly views. Although Schedule+ is very simple to learn and use, you should consider it only if you already have an investment in Microsoft Mail, and then only after seriously weighing the alternatives.

Now Up-to-Date has the best interface by far and the best support for off-line use — vital for PowerBook users. Small- to medium-sized groups (as many as about 50 people) in an informal environment should find that these pluses outweigh the program's lack of formal meeting-proposal features.

WordPerfect Office's Calendar has an attractive blend of features (especially considering the rest of the Office package), including useful meeting-proposal capabilities, but its cluttered, multiwindowed interface; Spartan views; and clunky repeating options limit its appeal.

When you call in all the cards (or appointments, in this case), Now Up-to-Date holds the winning hand. 

Eric Taub is a New York-based writer who's discovered that the more scheduling programs you have open simultaneously, the later you get.

Table 2: Group Scheduling Software

	Meeting Maker 1.5 ■■■■%	Microsoft Schedule+ 1.0 ■■■½	Now Up-to-Date 2.0 ■■■■½	WordPerfect Office 3.0 Calendar module ■■■½
List price	\$495 (five users) \$895 (ten users)	\$195	\$99 (single user) \$449 (five users) \$799 (ten users)	\$495 (five users) *
Company	ON Technology, Inc. 155 Second St. Cambridge, MA 02141 617-876-0900 617-876-0391 (fax)	Microsoft Corp. One Microsoft Way Redmond, WA 98052 206-882-8080	Now Software, Inc. 319 S.W. Washington St. 11th Floor Portland, OR 97204 503-274-2800 503-274-0670 (fax)	WordPerfect Corp. 1555 N. Technology Way Orem, UT 84057 801-225-5000 801-222-5077 (fax)

*Price is for complete WordPerfect Office package; Calendar module is not available separately.

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Optima
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Name your fonts and select them from any font menu.



A technical document might need a range of fractions or special symbols; create them quickly and easily in a custom font. Time taken to create: 1 minute. Keystrokes required: 6.

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Design and create a logo; then assign it to a keystroke.

Use the calligraphic or pressure-sensitive tool—as well as a full range of drawing tools to design your font from scratch.



Blend two fonts to create a third. Time taken to create: 2 minutes. Keystrokes required: 5.

abcdefghijklmnopqrstuvwxyz ABCDEFGHIJK LMNOPQRSTUVWXYZ 1234567890!@#\$%^&*O+?

This font "TFHabitat" was created in Fontographer by Joe Treacy of Treacyfaces, Inc.



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Fonts are like money; the more you have, the more you're able to do. Just think what you could accomplish if you had access to an infinite number of fonts.

Fontographer 4.0, the type manipulation and design program from Altsys, gives you that.


And more.

Fontographer actually lets you open copies of your fonts and—without drawing a thing—automatically modify characters and add new ones, turning your existing typefaces into entirely new personalized PostScript® language and TrueType® fonts.

Logical one-step commands make font customization quick and easy. With our new version of

Fontographer, anyone can blend two fonts to make a brand new one. Vary italic angles. Automatically space and kern any font. Autotrace scanned images to create new characters. Or instantly increase and decrease type weight.

Fontographer also lets you incorporate graphics into your fonts. Imagine a company logo or your signature as a keystroke.

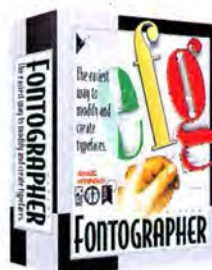
Here's one we recently added to this font: our  review rating from MacUser. According to MacUser's Bruce Fraser, Fontographer is the "tool of choice for creating fonts on the Macintosh."

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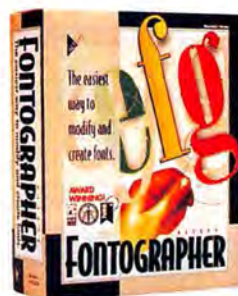
Lucida Handwriting

will be around for some time. Moreover, **high-quality TrueType** fonts keep flooding the market at rock-bottom prices. Case in point: Microsoft's TrueType Master Set for the Macintosh, which contains 102 fonts for \$99.95. In addition to 35 based on the original core fonts, it includes the extended Lucida family (from the respected Bigelow & Holmes foundry) and 45 publishing-oriented faces such as Gill Sans Ultra Bold and Onyx. 206-882-8080.

Fonts, glorious fonts: If you yearn to design fonts but feel daunted by the complexity of top-notch programs, take another look at Fontographer. Version 4.0 is a complete overhaul: Altsys streamlined the interface,

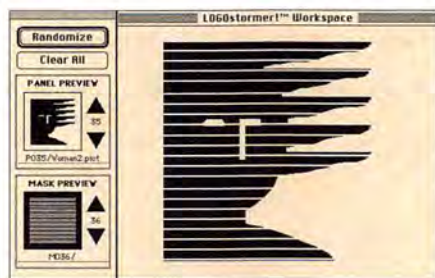
will be around for some time. Moreover, **high-quality TrueType** fonts

adding automated operations for freshman **font fiddlers** and packing in more than 200 power-user features for professional designers. Here are a few of the highlights: Borrowing from the Altsys-developed Aldus FreeHand, Fontographer 4.0 offers a complete drawing environment for creating outlines, including the ability to edit in Preview mode; a tool for adding polygons and starbursts to logos; and robust paint tools for editing bit maps. You can also eliminate clunky contours with Clean-Up Paths, a feature that removes extraneous Bézier control points and adds them where necessary.



Because spacing is one of the trickier aspects of type design, Fontographer 4.0 offers three levels of metrics control geared for pros and beginners (try the foolproof Auto Space and Auto Kern, each with Easy and Advanced settings). The packaging has been given a much-needed face-lift too. 214-680-2060. \$495. ♦ If all you really need is a new logo, check out LOGOstomer! 2.0, a nifty \$89

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By Pamela Pfiffner

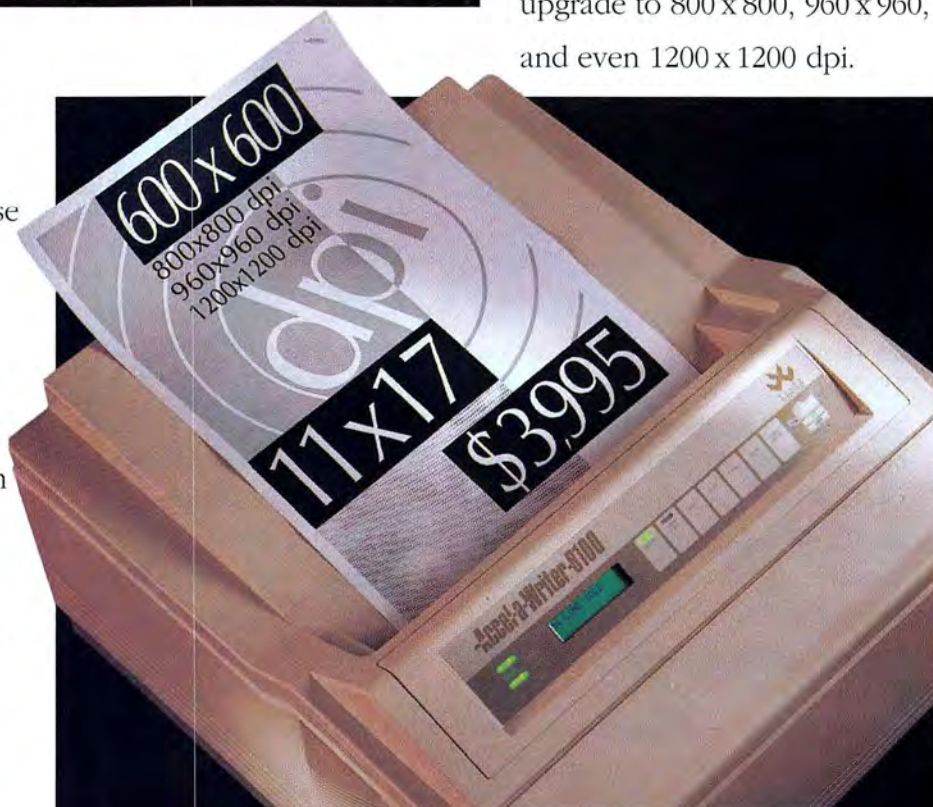
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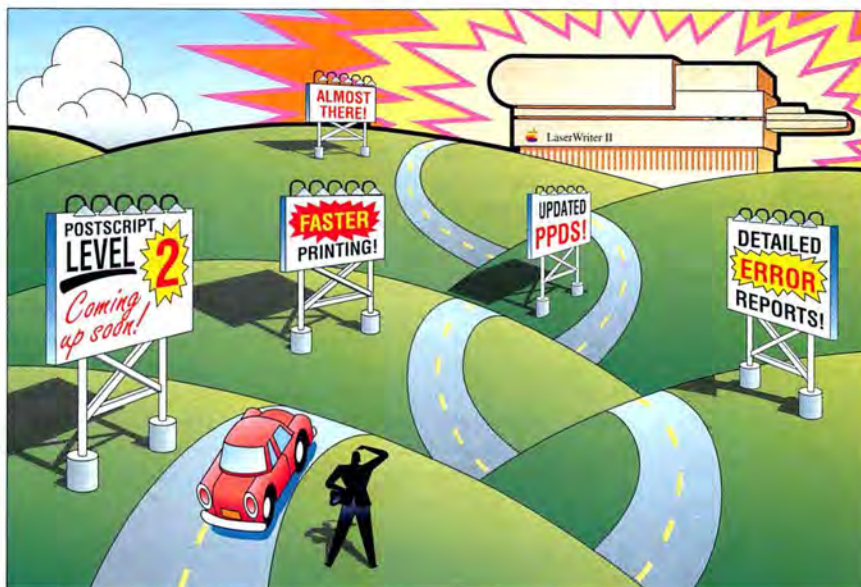
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Drive My Printer



When Adobe Systems announced PostScript Level 2 in 1990, a new laser printer driver was just around the corner. Three years later, it's here — almost.

By Bruce Fraser

It's been a long three years since Adobe Systems announced PostScript Level 2 along with promises of new features and faster printing. PostScript Level 2 printers have been available since August 1991, but after some initial excitement, the vast majority of users found that there was little they could do with a Level 2 printer that they couldn't do with a Level 1 printer — at least, not unless they enjoyed using a text editor to hand-code PostScript files. Although most PostScript-printer vendors have now moved to Level 2 printers, the advantage for users has been nebulous — a matter of unspecified future benefits. The reason? A lack of software that supports Level 2 features.

One key piece of software that's long overdue is a Level 2-aware Chooser-level driver. On the Mac, the printer driver performs two tasks: It takes output from an application, converts it to a form the printer can understand, and sends that information to the printer. The LaserWriter driver, which can be used for all PostScript output devices, converts the application's output to PostScript code, which it then sends to the printer. Hence, to get Level 2 PostScript code, we need a Level 2 driver. Applications that create their own PostScript code, such as Adobe Illustrator, use the driver merely as a pass-through mechanism to send the code to the printer. Those applications will show only a very slight speed gain, if any, from the new driver, but most other applications should derive significant gains.

The driver has taken much longer to develop than was originally promised by Adobe and Apple — so much so that whenever either company announced a slippage of the ship date to this or that quarter, the almost automatic response became "of which year?" Well, at press time, the Level 2 driver still hadn't shipped, but we *have* received final beta versions, and the shrink-wrapped software should be available by the time you read this.

The new driver will come in two forms, one from Apple and the other from Adobe. The Apple version is Apple LaserWriter Printer Driver 8.0; the Adobe version is called PSpinter 8.0. Functionally, the Apple and Adobe drivers are identical. PSpinter will be available directly from Adobe for \$24.95. Apple pricing hadn't yet been set at press time but is expected to be similar to Adobe's. According to Apple, LaserWriter Printer Driver 8.0 will be available on AppleLink. It may also be available on other on-line services licensed to distribute Apple software, and it will ship with forthcoming new Apple PostScript Level 2 printers.

Was it worth the wait? We ran some benchmark tests, using PSpinter 8.0, to see what you can expect in this initial version. (Because Apple's LaserWriter Printer Driver 8.0 is based on the same code, you can expect similar results from that driver.) We must stress that the benchmark data presented here is preliminary, because it isn't based on shipping software, but the driver has been so long in coming, and so much

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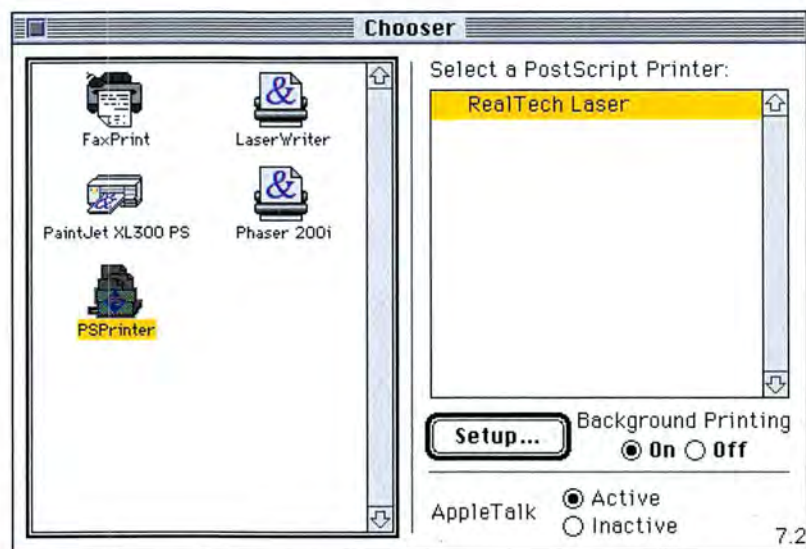
anticipated, that we allowed this departure from our normal practice of benchmark-testing only shipping software.

Bearing in mind that the data presented here is illustrative rather than definitive, we're pleased to report that PSpinter 8.0 offers significant speed gains for almost all types of documents printed to a Level 2 printer. It also improves Level 1 printer speeds for certain kinds of documents, most notably those containing bit-mapped graphics. In addition, it provides enhanced paper-handling features for Level 2 printers, boasts improved error reporting, offers certain nifty paper-saving options, and features better and more-flexible print-to-disk capabilities.

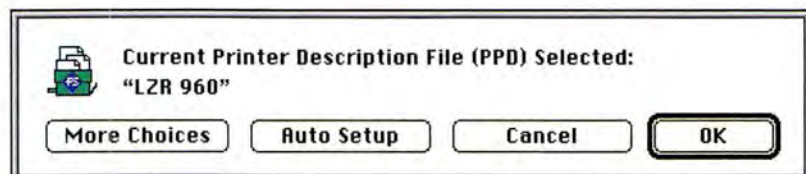
A development that should gladden the hearts of network administrators everywhere is that, unlike previous LaserWriter drivers, PSpinter can coexist peacefully with an older driver on a network: The new driver doesn't download

a dictionary (which is what's happening when you see the message "Initializing the printer"), so if you're using PSpinter and everyone else on your network is using the LaserWriter 7.1.2 (or earlier) driver, you won't cause reinitialization havoc.

The performance enhancements are all transparent: You get them simply by installing the driver — a straightforward process. To install PSpinter, you must be running System 6.0.5 or later; if you want to use background printing under System 6, you must install the System 7 Backgrounder and PrintMonitor files (the installer will do this automatically). In addition to installing the driver itself and the aforementioned files, the Installer also creates a Printer Descriptions folder in the Extensions folder and installs PPDs (PostScript Printer Descriptions) for a wide range of monochrome and color PostScript printers.



a



b

Figure 1: You can configure Adobe's new PostScript Level 2 printer driver, PSpinter, to automatically select the correct PPD (PostScript Printer Description) for your printer. This one-time operation involves clicking on Setup in the Chooser (a) and then clicking on Auto Setup. The driver queries the printer in order to find matching types; it's smart enough to recognize that the RealTech Laser uses the same PPD as the Dataproducts LZR 960, for instance (b).

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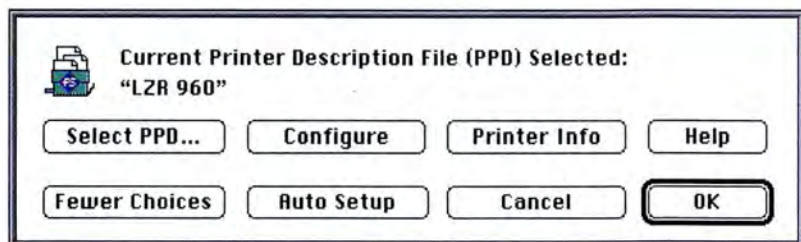
CIRCLE 190 ON READER SERVICE CARD.

PPDs are small files that incorporate descriptions of a printer's features, including paper-handling options such as multiple trays and optional extras such as envelope feeders and duplexers. To gain full control over such features from the Print dialog box, you need a PPD for your printer. Here is the only difference between the Adobe and Apple packages: The Apple version of the driver will ship with PPDs for Apple PostScript printers only. The Adobe version, on the other hand, will ship with *all* currently available PPDs, so owners of non-Apple printers and those who use a wide range of printing devices may find the Adobe package better suited

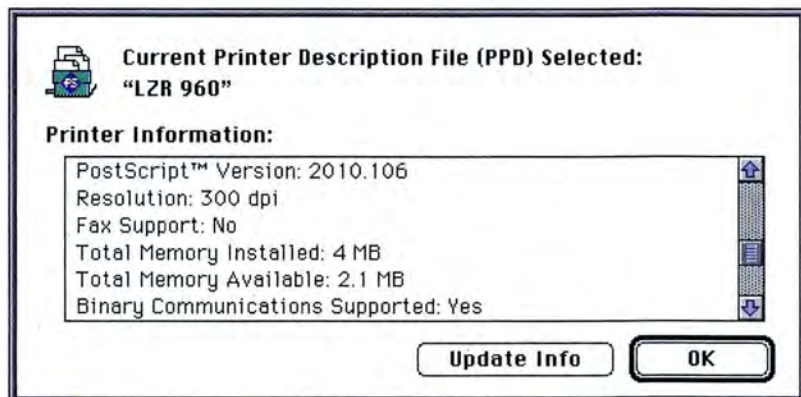
to their needs. However, if you install all the PPDs that ship with PSPrinter, the Printer Descriptions folder will take up 4.7 megabytes of disk space, so you may want to custom-install only the particular PPDs you need.

Once you've installed the driver, the next steps are to select a printer and configure the driver to work with it by choosing a PPD for that printer. The driver remembers the setup for all printers you configure, so you need to set up each printer only once. You can have the driver do this automatically, by clicking on Setup in the Chooser and then clicking on the Auto Setup button in the resulting dialog

The driver remembers the setup for all the printers you configure, so you need to set up each printer only once.



a



b

Figure 2: If PSPrinter is unable to find the correct PPD for your printer, you can click on More Choices, where you have the option of using the Generic PPD or manually selecting another one by clicking on the Select PPD button (a). If you are uncertain about your printer's configuration, you can get more information by clicking on Printer Info, which gives you a detailed report about your printer's RAM, resolution, and so on (b).



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box (see Figure 1). The driver then searches the Printer Descriptions folder for a PPD that matches the selected printer type; by querying the printer, it recognizes, for example, that a RealTech Laser printer is the same as a Data-products LZR 960 and selects the correct PPD.

There are limits to the driver's smarts, however: The Apple LaserWriter IIg has several different PPDs — one for each of its different RAM configurations; when you are printing to a LaserWriter IIg, the driver not only fails to select the correct configuration but it also tells you it can't find a match.

At that point, clicking on the More Choices button gives you the option of using the Generic PPD, which supports most features other than printer-specific ones, or manually choosing a similar printer's PPD. In the case of the LaserWriter IIg, you have to choose the correct PPD manually, which means that you have to know how much RAM your printer has. Fortunately, there's a way to find out: The new driver's Setup dialog box includes a Printer Info button; click on that button, and the driver queries the printer and then displays details of its configuration, including the amount of RAM installed (see Figure 2). Once you've completed the setup, your driver is ready for use.

Setup and Print

You'll notice slight differences between the Page Setup and Print dialog boxes and their previous versions. In Page Setup, the dogcow is gone, replaced by a

page image containing a more dignified lowercase *a*, which now appears in both the Page Setup and the Page Setup Options dialog boxes (see Figure 3). The outer rectangle represents the edge of the paper, and the inner, dotted rectangle

represents the printer's maximum image area. The page image also changes orientation to reflect the state of Portrait or Landscape modes and the Flip Horizontal, Flip Vertical, and Invert Image settings. The paper sizes are now on a pop-up menu; the sizes offered depend on your current PPD selection.

A major addition to the Page Setup dialog box is a Layout pop-up

menu, which allows you to print thumbnails of your pages either 2 Up, where two document pages are printed at a reduced size on a single sheet, or 4 Up, where four pages are reduced to print on the same sheet. The Page Setup Options dialog box contains the same options found in the previous version of the driver, with the addition of the Help button that's present in all PSPrinter dialog boxes.

The Print dialog box now lets you print the first page of a document from one paper source and the remaining pages from another if you're using a multitray printer (see Figure 4). You can't, however, specify a range of pages to be printed from one tray and another range from another. But you can choose a destination for the print job: the currently selected printer, a file, or a PostScript fax-equipped printer. (The fax option appears only when a fax-capable printer is

**The Print dialog box
now lets you print
the first page from
one paper source
and the remaining
pages from another
if you're using a
multitray printer.**

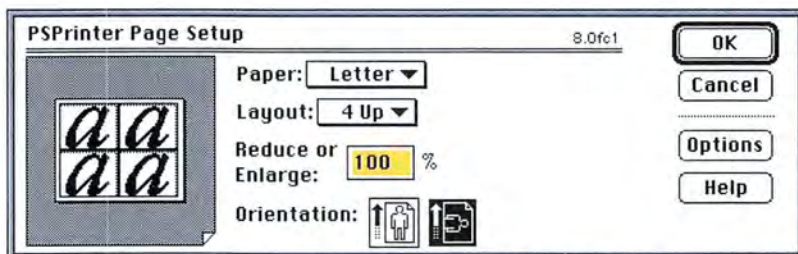


Figure 3: The Page Setup dialog box sports a new look. The letter *a* — which replaces the dogcow — matches the page-image orientation. A major improvement is the introduction of 2 Up and 4 Up layouts for printing thumbnail versions of documents.

selected.) Application-specific options also appear in the Print dialog box.

The Options button allows you to choose whether or not to print a cover page and whether to print in Color/Grayscale (the default) or Black and White. A new option, Calibrated Color/Grayscale, provides a closer color match to the Apple 13-inch RGB monitor on Level 2 printers. It also allows you to set printer-specific options such as selectable resolution, FinePrint, and PhotoGrade where applicable. In future versions of the driver, we hope to see support here for ColorSync, Apple's system-level color-management technology (see "Getting Color in Sync," March '93, page 165).

PostScript-error reporting in previous driver versions was limited to a message that flashed on the screen for a few fleeting moments. The new driver provides a little more flexibility, offering three error-reporting options. The default, No Special Reporting, provides no detailed information about the PostScript error. Summarize on Screen displays a

message describing the error — this option is disabled when background printing is turned on. Print Detailed Report sends a report describing the error to the printer for hard-copy documentation. True, these are welcome improvements,

but we would also like to see an option that allows detailed reporting to the screen when background printing is turned on.

Printing to Disk

In PSPrinter, the print-to-disk options have been greatly expanded (see Figure 5). First, you're given the choice of creating a PostScript Job file, which can be down-

loaded to a PostScript printer, or an EPS file, which can be placed in another application such as a page-layout program. EPS files can have one of three preview options: Mac Standard, which produces a 1-bit, 72-dpi preview; Mac Enhanced, which provides a scalable PICT preview that can be scaled without jaggies; or No Preview, which is intended for transfer to other computer platforms.

You can choose between ASCII and binary encoding for files. The default,

The Options button allows you to choose whether or not to print a cover page and whether to print in Color/Grayscale or Black and White.

Printer: "RealTech Laser" 8.0fo1

Copies: Pages: ☒ All ☐ From: To:

Paper Source **Destination**

☒ All ☐ First from: ☒ Printer

☐ File

a

Print Options 8.0fo1

Cover Page: ☒ None ☐ Before ☐ After Document

Print:

PostScript™ Errors:

TraySwitch:

b

Figure 4: The Print dialog box offers flexibility in choosing paper sources and printing files to disk (a). Under Options, you find more handy output choices, including simple color matching, cover-page printing, tray switching, and PostScript-error reporting (b).

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ASCII, creates the most-portable files, because any application or device that understands PostScript should be able to read ASCII PostScript files. Binary encoding creates much smaller files and hence speeds printing, but the destination printer must be able to handle binary encoding or the files won't print. All Level 2 printers support binary encoding. Most Level 1 printers don't. You can find out if your printer supports binary encoding by using the Printer Info button in the Setup dialog box.

You can set the level of PostScript compatibility for print-to-disk files. Level 1 Compatible, the default, creates a file that's compatible with all PostScript printers. Level 2 Only creates PostScript Level 2 code: It can be understood only by Level 2 printers but prints to those devices faster than Level 1 code does.

The final print-to-disk option deals with font inclusion. You can choose None (no fonts), which is fine when you know that all the needed fonts are available on the device where the file will be printed

or previewed; All, which includes all the fonts in the document that are available on the host Mac; or All But Standard 13, which includes all the fonts in the document except the core set of 13 typefaces found on virtually every PostScript

printer since the original LaserWriter.

The print-to-fax option works only with PostScript printers equipped with fax capabilities. The support for this feature is fairly rudimentary: When you choose Fax as the destination, the Print

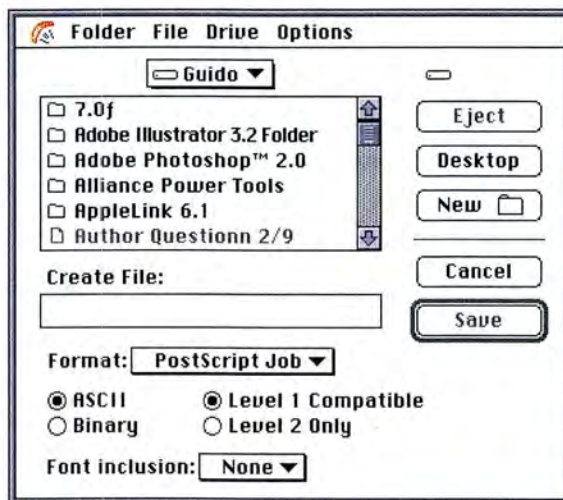


Figure 5: When you're printing files to disk, PSPrnter lets you choose from several file and preview options as well as whether or not to include fonts in the PostScript file. You can also elect to use the ubiquitous ASCII encoding or the more efficient binary encoding.

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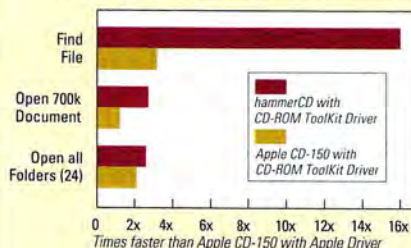
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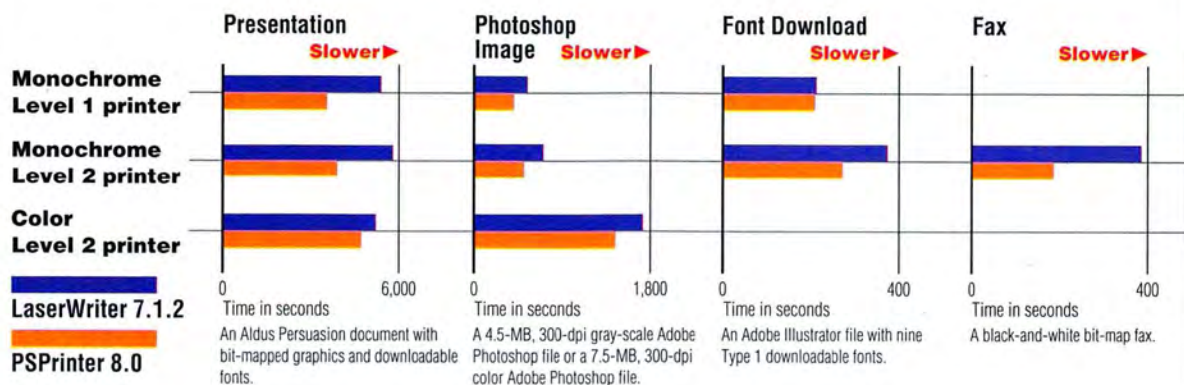
**Figure 6: Level 2 Driver Time Trials**

Figure 6: We put Adobe's PSprinter 8.0 through its paces to get a preliminary idea of how this beta-version printer driver would affect performance on monochrome PostScript Level 1 and Level 2 printers and on color Level 2 printers. We compared its times with those of the existing

Apple LaserWriter 7.1.2 driver. The most-noticeable speed gains were with files that contained large bit maps (especially the fax). The results of the font-download test on the Level 1 printer and the Word test (not shown here) on both monochrome printers were less remarkable.

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button changes to Fax. Clicking on this button opens the Fax dialog box, where you can enter the name, organization, and fax phone number of both the sender and the receiver. The sender information is retained for future transmissions, but

there's no facility for an address book or for faxing to multiple destinations.

Under the Hood

That pretty much covers the most-obvious differences between PSPrinter

and its predecessors. Many of the other important differences are under the hood, and all you see of them as a user is a speed improvement. The faster speed is attributable to several factors. First of all, PSPrinter produces more-efficient PostScript code than previous drivers. Simple calculations have been moved from the printer to the host computer: Instead of sending `3*3`, for example (or in PostScript parlance, `3 3 mul`), the driver sends the value 9. These changes speed up all PostScript printers, Level 1 and Level 2 alike.

When it's printing to Level 2 printers, the driver can usually reap the benefits of Level 2 features. Binary encoding results in files that are 15 percent smaller than their ASCII equivalents and thus faster to send. Level 2 operators are also more efficient. For example, the instructions for drawing a filled rectangle take only one line of code in Level 2, compared with nine in Level 1. And PSPrinter uses RLE (run-length encoding) compression on monochrome and gray-scale bit maps to further reduce the amount of time it takes to send data from the host to the printer. Level 2 code also makes for much smaller print-to-disk files.

In our tests, PSPrinter turned in shorter print times than the LaserWriter 7.1.2 driver, whether with a Level 1 or a Level 2 printer (see Figure 6). On the Level 1 printer, the most-significant speed increases were with the presentation and Photoshop files, which contained large bit maps. On the monochrome Level 2 as well as the color Level 2 printer, however, we saw significant speed increases across the board. The smallest reduction in printing time, about 8 percent for a ten-page Word document using printer-resident 12-point Times Roman (not shown in Figure 6), was mostly attributable to binary encoding. For most types of documents, we saw reductions of around 25 to 30 percent on the monochrome printers and 10 to 15 percent on the color one. The largest reduction was when printing a fax-modem document — a series of large bit maps — from FAXstf to a Level 2 printer; in this test, the new driver took half as long as the old one.

We noticed only two differences in the output from the old and new drivers. When printing a color document to a monochrome printer, the new driver gives much-better-looking results. However, it does so at the expense of fidelity to the

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original. A gradient fill in the original color document was translated by LaserWriter 7.1.2 to an ugly but unmistakable gray-scale gradient fill, whereas PS-Printer rendered it as a flat gray. This may be problematic for some people, but we suspect that most will prefer PS-Printer's output.

A potentially more serious anomaly surfaced, ironically, with our simplest test file, the ten-page Word document. It had page numbers at the top of each page, which printed correctly when we

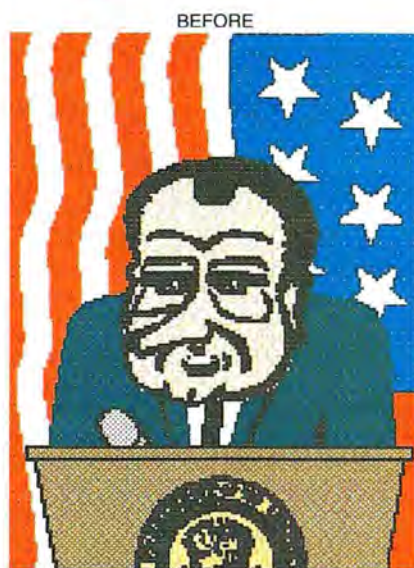
PSPrinter is an encouraging, albeit long overdue, first step. We hope it spurs developers to take advantage of some of Level 2's more advanced features.

used the old driver but appeared only on the first page when we used the new one. Adobe acknowledged that this quirk was probably a bug in beta software.

PSPrinter isn't quite everything we'd hoped it would be. We'd like to see more flexibility in the paper-handling options and better fax support. The omission of ColorSync support is perhaps the biggest disappointment. But based on this first look, we suspect that everyone who has a Level 2 printer will benefit from the new driver. If you're still using a Level 1 printer, the incentive to upgrade is less clear-cut. If a significant part of your printing contains bit maps, you'll notice a substantial speed gain. For most other jobs, the gains are so slight as to be almost unnoticeable. But the ability to print two-page and four-page thumbnail layouts and the increased flexibility of the print-to-disk options may provide sufficient incentive to make the move. PSPrinter is an encouraging, albeit long overdue, first step. We hope it spurs developers to take advantage of some of Level 2's more advanced features, such as forms caching and pattern caching — both of which must be supported by the application rather than by the driver. 

Bruce Fraser has been writing about PostScript Level 2 for three years and about printers for even longer.

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CIRCLE 91 ON READER SERVICE CARD.

Entering the Third Dimension

Craft a complex still life by combining simple lathed objects and geometrical shapes in Infini-D.

By Janet Ashford

Intimidated by 3-D? Don't be. With today's intuitive 3-D programs, you can create stunning illustrations with ease. By building complex objects out of elementary shapes, applying ready-made textures, and adding light sources and backgrounds, you can create convincing realizations of still lifes, interior designs, and architectural renderings.

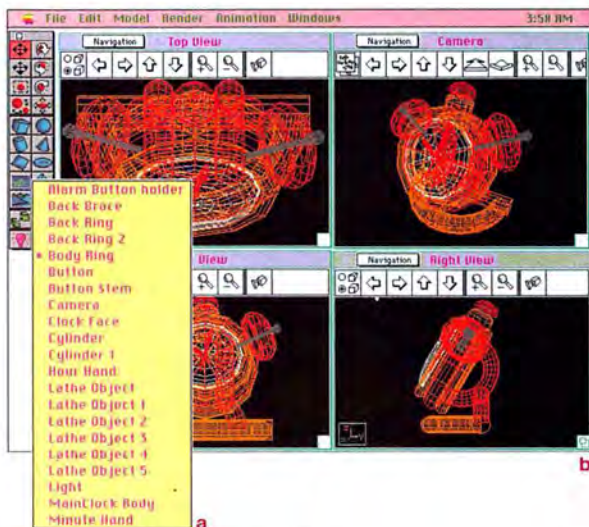
Artist Chuck Carter, of Cyan, in Spokane, Washington, used Specular International's Infini-D to construct a still life of objects on a tabletop, drawing on the program's primitive-shapes tools (for creating cubes, spheres, columns, and so on) and its lathing and extrusion functions. Although the result looks like a daunting one to achieve, the scene isn't difficult to assemble once you've mastered a few basic 3-D concepts.

Carter offers this advice to novice modelers: When creating your objects, think like a photographer. Keep the shapes simple, and use surface attributes to make them stand out. Study objects on your own shelves to see how they're made; using the correct details enhances realism. Then, when arranging those objects in a scene, think like a designer. Consider the direction of objects (for example, the way handles, arrows, and other lines are pointing), and make use of the negative space between objects to develop your composition. Keep lighting simple but effective. A well-directed main light source adds drama to even the most rudimentary scene.

Janet Ashford is coauthor of the forthcoming *Desktop 3D*.

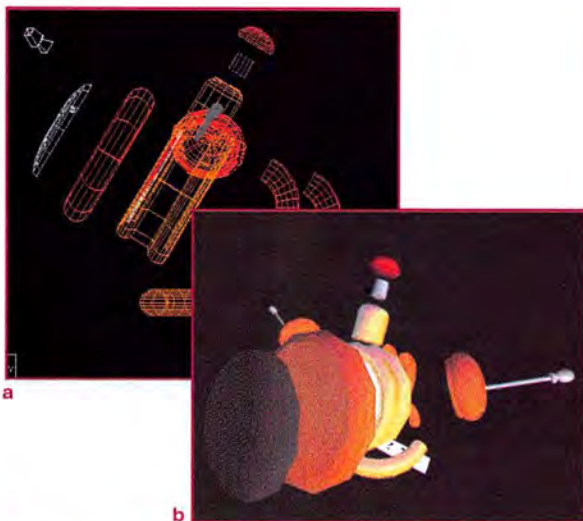


To create a realistic still life, Spokane artist Chuck Carter applies ready-made and scanned textures to objects constructed from simple shapes. He creates each element of the still life in a separate document and then copies and pastes it into a single model scene. After arranging light sources, he renders the model with ray tracing, a sophisticated rendering method that reveals in detail all the colors, textures, and other properties such as reflectivity and transparency that have been applied. The result is what Carter calls a "super-superrealist" illustration.



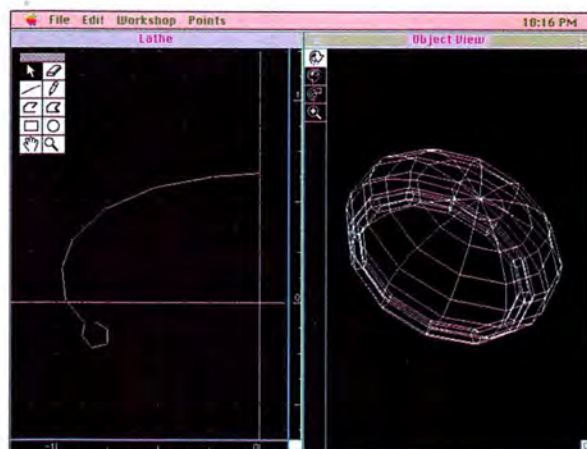
1 Constructing the Clock

Each object in the still life is made up of several smaller, simpler objects grouped together. The alarm clock, for example, consists of 21 objects, each of which is named and listed in a pop-up menu attached to the object (a). Some objects, such as the bell clappers, are constructed with Infini-D's column and sphere tools, which create geometrical primitives. The bells, on the other hand, are simple lathed objects. The Infini-D interface allows Carter to see the clock in several views — such as top, camera, front, and right (b) — simultaneously.



2 Disassembling the Clock

Ungrouping the clock's elements and moving the pieces apart by using Infini-D's horizontal and vertical plane tools (H-Plane and V-Plane) provides a clear picture of how the clock is made. Shown here is an exploded view of the clock in Wireframe mode (a) and a camera view of the clock in Shade Better mode (b).



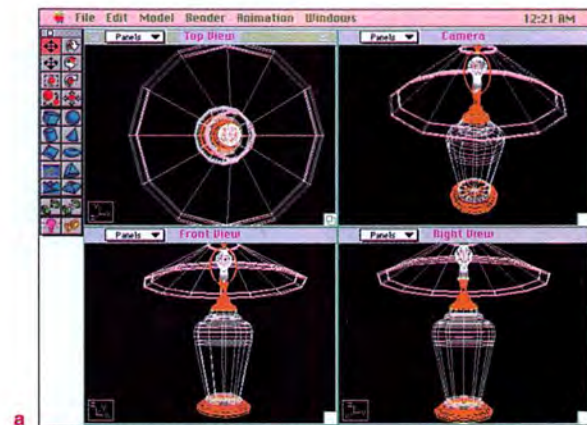
3 Creating a Lathed Object

To create the bells for the clock, Carter opens Infini-D's Lathe workshop and uses its drawing tools to make a flanged outline. He then specifies that the outline be lathed 360 degrees, with 12 polygonal sides. The straight sides smooth out when ray tracing is applied; the more sides there are, the rounder the object will look. A wire-frame view of the lathed object appears in the Workshop window.



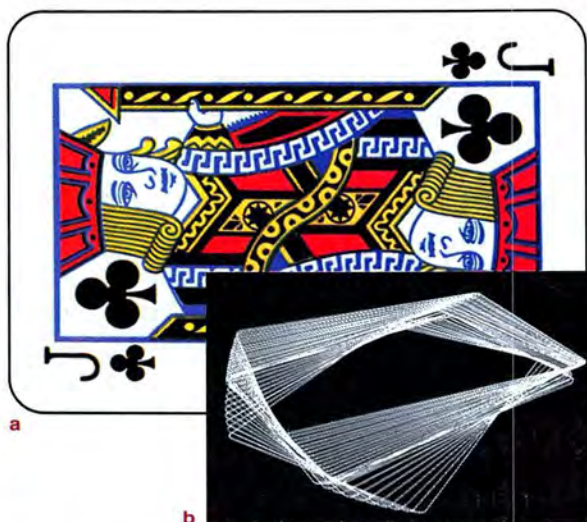
4 Applying Surface Maps

Carter applies Infini-D's brass and copper surface maps to the metal parts. Then, to create a realistic clock face, he imports two graphics created in Adobe Illustrator and Photoshop: a color PICT map with numbers, texture, and graphics (a), and a bump PICT map, which lends a relief texture to the clock face (b). Carter applies the two maps to a squashed cylinder behind the transparent glass cover of the model clock face. He adjusts their size to fit, using Infini-D's Surface Composition dialog box.



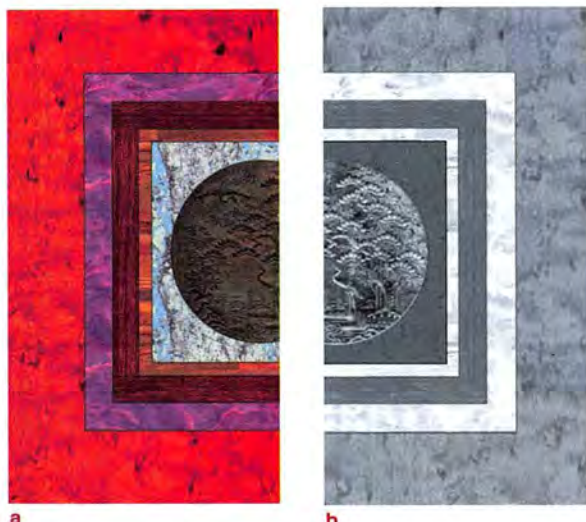
5 Creating the Lamp

To fashion the lamp, Carter again turns to the Lathe workshop to create the base, body, and other elements. He assembles them (a) and then applies color maps (b) and bump maps (c) to the lamp body. Only the lamp base and body are visible in the camera view, but the light source within the lamp's "light bulb" shines on the objects around it.



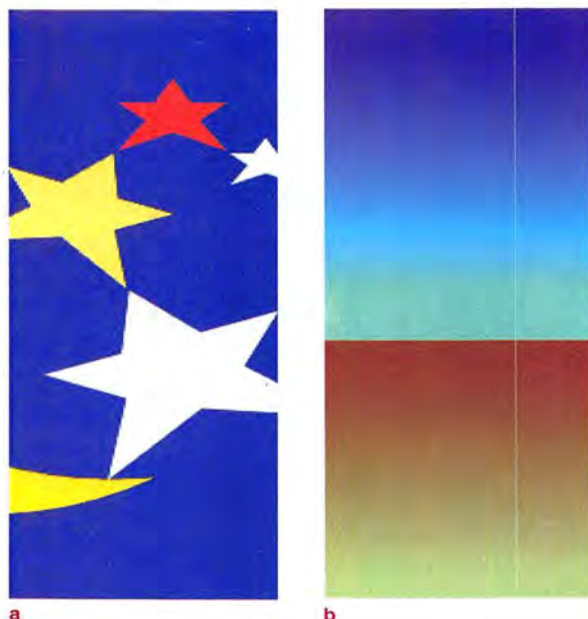
6 Stacking the Deck

To make the playing cards, Carter scans actual cards (a) and then applies them in Infini-D as surface maps to slightly extruded rectangles. To fan the deck — shown here in wire-frame view (b) — he duplicates the first card, rotates it, and positions it above the original. This “child” card is then linked to its “parent.” Using the Duplicate as Child command creates copies with the same rotation and repositioning relative to the last-used parent.



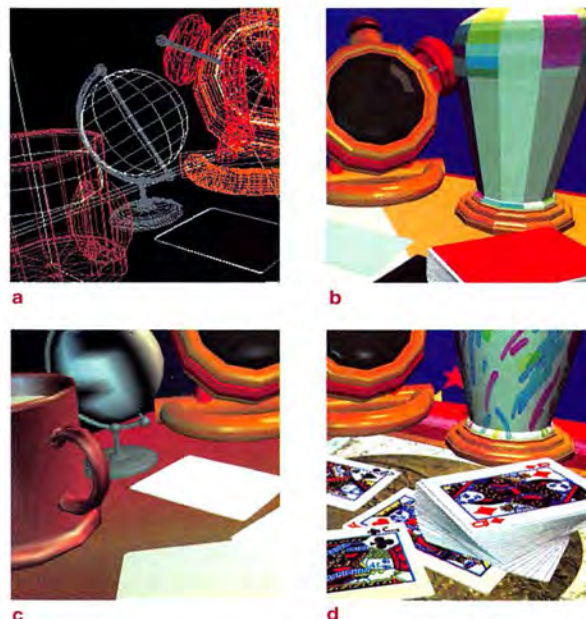
7 Creating the Tabletop

A table with the look of intricate inlay adds a special touch of realism and refinement to the scene. Using Photoshop, Carter combines scanned marble and wood textures into color maps (a) and bump maps (b) for the table. He then applies them to a slightly extruded square, using Infini-D.



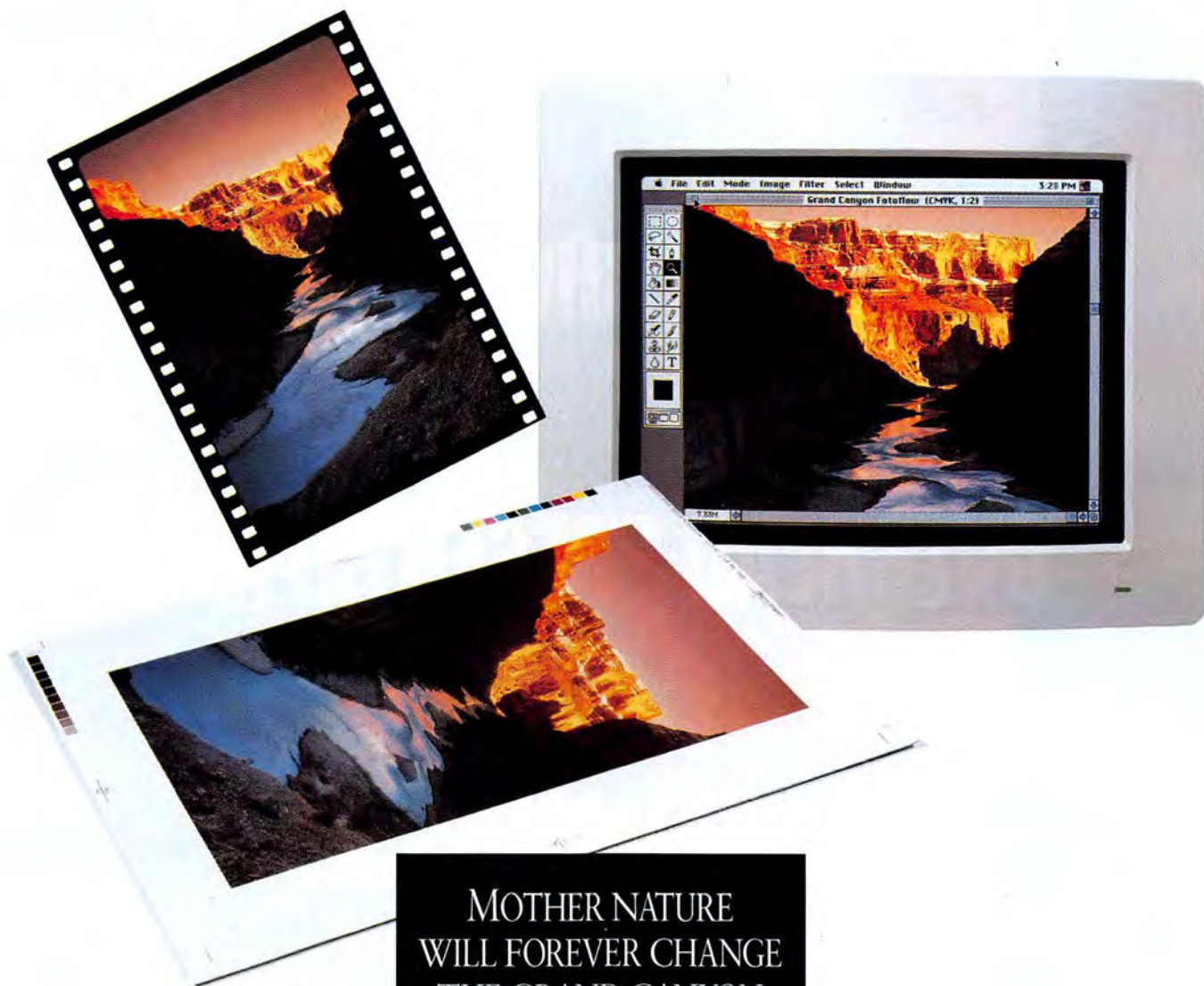
8 Adding Final Details

After creating the cup and globe with the same methods he used to make the other objects, Carter adds finishing details to the tableau. To a wall behind the scene, he applies a wallpaper pattern generated in Illustrator and Photoshop (a). Adding a reflection map to the environment around the scene enhances realism by reflecting its rudimentary landscapelike color gradations in the shiny surfaces of the objects (b).



9 Rendering the Model

To complete the still life, Carter composites all the objects into a single scene before final ray tracing. In Wireframe mode, each object is rendered by a grid of lines showing the averaged color of its associated texture map (a). Other rendering options include Shade Fast (b); Shade Better (c); or Shade Best (d), which is closest to how the final ray-traced image will look. Objects within the scene can be rotated or repositioned at any time, and the scene can be viewed from any camera angle.



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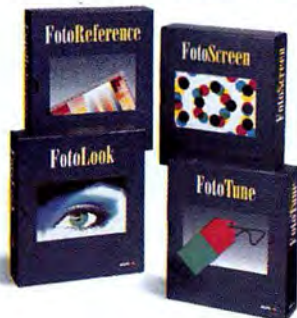
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AppleShare servers. 800-862-2526 or 805-966-2432. For 1 user, \$199; for 10 users, \$995; for 30 users, \$1,995. * Compliments of Artisoft (800-

846-9726 or 602-293-4000), here's another way for you to share files with Intel boxes — as long as they're on a LANtastic network. LANtastic for Macintosh is gateway software that's not Mac-based, despite its name. It runs on a dedicated PC and makes LANtastic volumes on the PC

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By Stephan Somogyi




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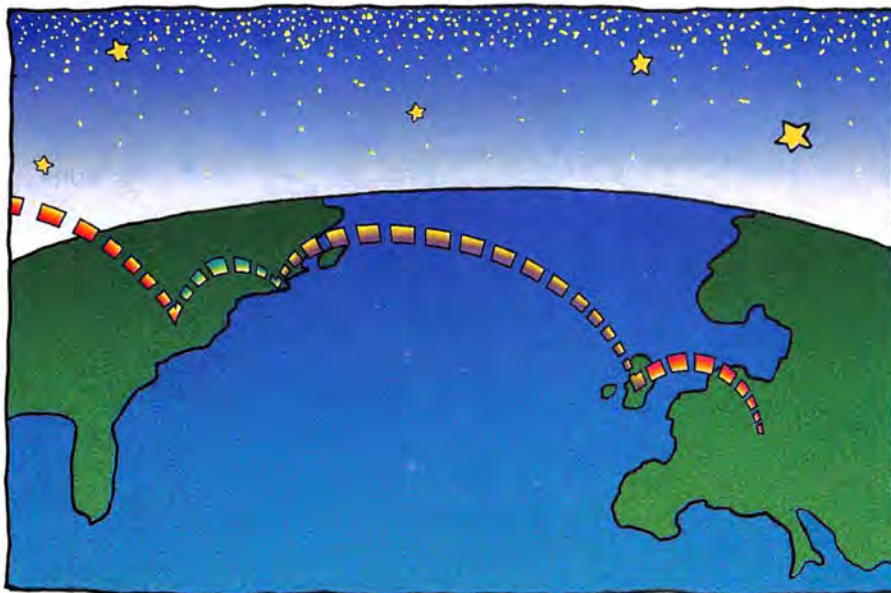
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CIRCLE 192 ON READER SERVICE CARD.

Long-Distance Operators



If your AppleTalk network spans multiple far-flung sites, you need routers that can go the distance — with help from two new protocols.

By Kurt VanderSluis

When you decide it's time to connect your local network of Macs with the ones at your company's other sites across the country, be prepared: It's not exactly a plug-and-play proposition. AppleTalk may be great for networking local workgroups, but it just wasn't designed for WANs (wide-area networks). In particular, it wasn't meant to handle wide-area routing and the complications that occur when you send data across a vast internet to distant sites.

Fortunately, help is on the way from not one, but two, sources. The first is Apple. An Apple team has been busily designing a new routing protocol called AURP (AppleTalk Update-based Routing Protocol) — a protocol that's available with the new Apple Internet Router (version 3.0) — to handle WAN connections. In addition, a group of vendors that includes Cayman, Cisco, Novell, Shiva, and Wellfleet is developing its own wide-area protocol, code-named Dr. Pepper, which will soon be available as a router option.

If you're building a large internet or expanding the one you have, you'll want to know how these new protocols can help solve your WAN routing problems and which one is better for your needs.

WAN Performance

First, let's go over some background. AppleTalk's routing protocol, RTMP (Routing Table Maintenance Protocol), was designed to handle routing in local workgroups rather than

over WANs. Its limitations include the following:

- There's no way to resolve conflicts between two routers that have contradictory information — a likely occurrence in a large company internet that has multiple managers.
- Its information-exchange scheme requires routers to broadcast information such as node numbers and names every ten seconds, creating overhead traffic that becomes unmanageable when two or more large campus internets are joined over WAN connections.
- It has no provisions for managing network security, although some vendors have devised their own methods to protect zones and devices from intruders.
- Its limitation of 15 hops, or routers in series along a path, between any two of the nodes on the internet is an unrealistically limiting number for many corporate internets that exist today.
- Its routing algorithm is based on the number of hops (that is, it assumes that the best path is the one with the fewest hops) rather than on characteristics such as speed, utilization, and reliability. These characteristics can be more important than the number of hops in picking the best path between two distant sites.

These limitations of RTMP don't mean it's obsolete, however. Both AURP and Dr. Pepper take the approach of supplementing RTMP rather than replacing it. Routers within each site's internet can still use RTMP as their internal-routing

Figure 1: When Network Numbers Collide

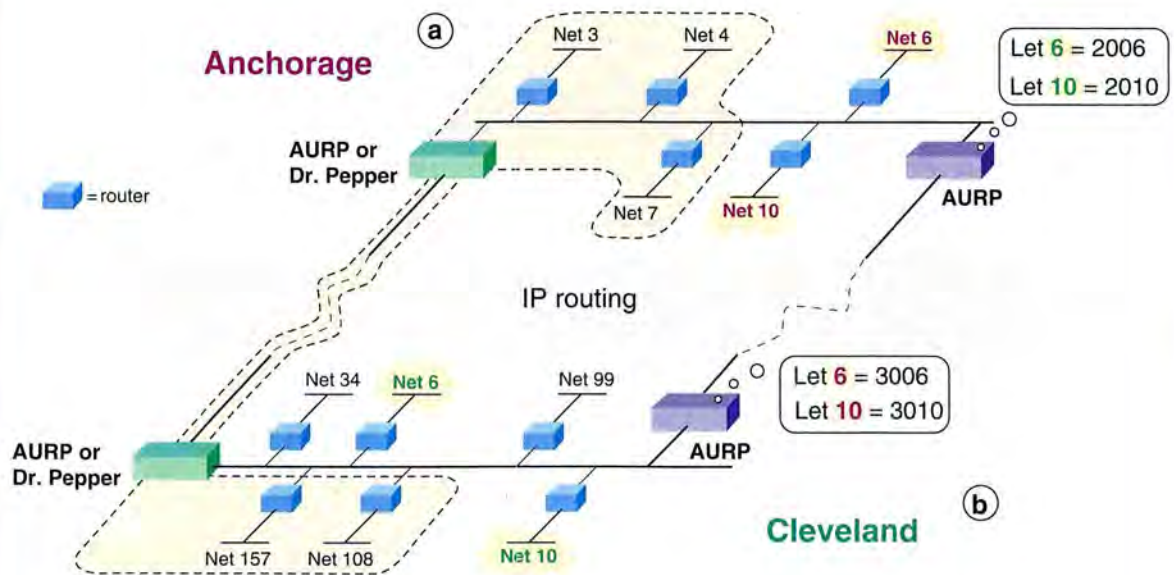


Figure 1: When you start connecting networks in far-apart locations — say, Cleveland and Anchorage — over wide-area links, you may find that some network numbers (such as 6 and 10 here) occur in both sites, which can lead to routing confusion. Fortunately, the new AURP and Dr. Pepper wide-area-routing protocols allow network hiding, so you can exclude conflicting networks rather than share

them over a wide-area link (a). AURP has additional features, such as the option of remapping network numbers so they don't conflict with network numbers at the sister site (b). Each protocol is designed to run alongside AppleTalk's RTMP in external routers that connect to similarly equipped routers at the sister site, and each allows tunneling of AppleTalk through IP and PPP.

protocol, and *external routers* equipped with AURP or Dr. Pepper can connect to similarly equipped routers at sister sites.

Two Approaches

AURP and Dr. Pepper use similar strategies, but their results have some notable differences.

The Similarities. AURP and Dr. Pepper use similar strategies for improving wide-area AppleTalk routing:

- They use proven methods — that is, existing protocols that perform well for WANs — to send AppleTalk information between campus internets.
- They define the standard methods and data formats for encapsulating AppleTalk information inside each of the wide-area protocols selected.
- Their routers translate AppleTalk information between RTMP and the wide-area protocols, using these standard methods of encapsulation.
- They define additional management and security features for routers as needed

to improve the routers' performance and also to make them easier to use.

The Differences. Although the strategies for these two protocols are similar, the data formats they define for encapsulation of AppleTalk within wide-area protocols are different, which means that Dr. Pepper and AURP are incompatible with each other. Although it's possible to have both kinds of external routers in your WAN or even in your local campus network, an AURP router cannot be paired with a Dr. Pepper router to form a WAN connection.

The differences in the feature sets of the two protocols reflect the divergent visions of the two design teams (see Table 1). The AURP designers set out to make a highly sophisticated wide-area-routing protocol with a rich set of features for WAN designers and network managers — features so powerful that they must be used carefully. In contrast, Dr. Pepper aims to be a simple, no-frills wide-area-routing protocol that meets a more

particular need: creating an easy, reliable AppleTalk connection between two points in a WAN.

A Sample Scenario

Let's say that you are in charge of your company's main AppleTalk internet, in Anchorage, Alaska, and that you have been asked to construct wide-area AppleTalk links to your company's other division, in Cleveland, Ohio (see Figure 1). Your company already has a WAN operating between these sites, routing IP (Internet Protocol), but AppleTalk routing over this WAN was not allowed before.

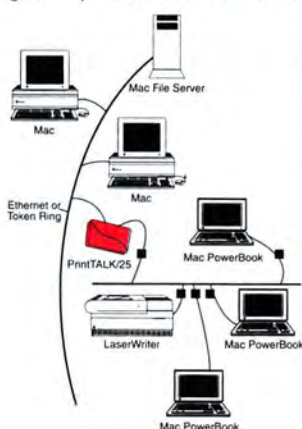
In an all-too-realistic scenario, let's also say that the AppleTalk internets at the two sites were built by independently operating network staffs with no technical coordination between them, so the proposed wide-area internet has network-number conflicts. In this case, each site has networks numbered 6 and 10. To activate an RTMP link between these

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	Model	Network Connections	Operating Systems	Ports	Printers	Memory	Price
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	SPTLK25T	4/16Mb Token Ring DB9 and RJ45	AppleTalk	* DIN8 LocalTalk	Up to 8 LocalTalk printers/devices	512Kb RAM, 256Kb ROM	\$1095
PrintTALK/200 available Q2/93	SPTLK200E/AN	Ethernet 10BaseT and BNC Thinet	AppleTalk/Novell	DIN8 LocalTalk, 1 parallel 1 Uniport	Up to 8 LocalTalk printers/devices, 1 parallel PostScript, 1 parallel or serial PostScript	2Mb RAM, 512Kb Flash ROM	\$1295
	SPTLK200T/AN	4/16Mb Token Ring DB9 and RJ45	AppleTalk/Novell	DIN8 LocalTalk, 1 parallel 1 Uniport	Up to 8 LocalTalk printers/devices, 1 parallel PostScript, 1 parallel or serial PostScript	2Mb RAM, 512Kb Flash ROM	\$1495

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BRIDGES NETWORK MANAGEMENT

two sites, either you or your counterpart in Cleveland will have to remove the conflict by reconfiguring the local router connecting these networks — if such a reconfiguration is feasible.

With AURP and Dr. Pepper, however, your options are expanded. Perhaps only a portion of each site's networks need to be shared and these portions do not include conflicting network numbers. In this case, you can use either of the new protocols, because both AURP and Dr. Pepper allow you to select which networks to share over the wide-area link and which to exclude.

If, however, you want to share networks 6 and 10 in Cleveland with all the networks in the Anchorage site and changing the network numbering scheme is impractical, you don't have a choice. You must use AURP in your external routers, because only AURP can remap the conflicting network numbers between the sites. In Anchorage, Cleveland's networks 6 and 10 can be remapped by Anchorage's external router (running AURP) to avoid the conflict. If you want, you can even specify a range of network numbers you'd like the AURP external router to use when it remaps the conflicting network numbers.

AURP also has other features you might want, such as an option to *cluster* several networks so they appear to routers at the other site to be just one network. For example, you can configure

the AURP external router in Cleveland so that it represents the entire Anchorage internet as a single extended network. If you do this, the Cleveland RTMP routers — the internal routers that aren't directly connected to routers at the Anchorage site — will not need as much memory, because they will need to know about only this single extended network, which contains all of the Anchorage zones.

Another handy feature offered by AURP is hop-count reduction, which allows you to send data to networks that are more than 15 hops away (AppleTalk's limit). You can also use this feature to help your router pick better paths for wide-area routing. For example, if you have a fast link with many hops and a slow link with fewer hops, you can have the external router artificially reduce the number of hops along the fast route to make it preferable.

Protocol-Product News

At press time, Apple had just come out with a router supporting AURP: version 3.0 of Apple Internet Router (\$499); it requires AppleTalk/IP Wide Area Extension (also \$499). Apple Internet Router is software, not hardware; it runs on a Macintosh that's simultaneously connected to one or more networks and routes AppleTalk over LAN (local-area network) and modem connections. With AppleTalk/IP Wide Area Extension, a

Table 1: WAN-Protocol Features Checklist

Feature	AURP	Dr. Pepper
Support for tunneling AppleTalk through the wide-area-routing protocols IP and PPP	✓	✓
Network hiding, so you can select which networks are shared or excluded over the wide-area link	✓	✓
Individual-device hiding by name and type	✓	
Network-number remapping to avoid network-number conflicts between sites	✓	
Clustering of remapped network numbers to conserve router resources (so that several networks at a distant site can appear to your local RTMP routers as a single extended network)	✓	
Hop-count reduction to allow internets with more than 15 hops (routers along a given path) and to provide a way to force routers to choose a particular path over others	✓	
Modem callback for increased security	✓	
Data compression for increased throughput	✓	

network manager can make a link encapsulating AppleTalk inside IP to a similar AURP-equipped router at a distant site. The link between the sites can occur either over a dedicated connection controlled by the company's network staff or over a nationwide network, such as the Internet, that routes TCP/IP (Transmission Control Protocol/Internet Protocol) traffic. IP determines the path by which the encapsulated AppleTalk information travels between the sites.

Apple Internet Router is easy to set up and offers the full AURP feature set. It also includes an SNMP (Simple Network Management Protocol) module for network management. This router's apparent ease of use is deceptive, however. By using some of AURP's more advanced features without careful planning, you can easily create chaos in your WAN. With the hop-count-reduction feature, for example, you could potentially create an endless loop in a redundant network (a network with multiple paths between any two sites) unless you thought through all the possibilities first.


Setting up a complicated AppleTalk

WAN with AURP does require a good deal of planning — but then, creating any kind of WAN has always required a lot of planning. At least now you have more-powerful tools to work with.

Each protocol lets you select which networks to share over wide-area links and which to exclude, but only AURP can remap conflicting network numbers.

Pick a Protocol

Although it's too soon to evaluate how AURP and Dr. Pepper compare, it's not too soon to think about which best meets your wide-area-routing needs (see the "WAN Planning Wisely" sidebar).

Which vendors will support these protocols? Most vendors are reluctant to commit to AURP and are expressing support only for Dr. Pepper. If AURP receives any kind of market acceptance, however, router vendors will probably change their minds and incorporate AURP into their routers as well, perhaps as an added-value feature. With the large number of router vendors now in the marketplace, no vendors can afford to be left out of the competition by not offering a feature the others have — or they might end up as WAN-vendor wannabes. 

Kurt VanderStuijs is president of The Network Group, a training and consulting firm in Seattle.

WAN Planning Wisely

Which protocol will you want to use in your external routers? Obviously, if you need the extra features AURP offers (see Table 1) — for example, if the networks you're connecting have number conflicts or if you need to go farther than 15 hops between routers — you should go with AURP.

If you don't need AURP's extra features, your existing router setup may be a deciding factor. For example, if your router vendor supports only one of the protocols, you'll probably choose that protocol rather than buy new routers. If your router vendor supports both protocols and you don't have a lot of experience with either protocol, you may want to ask your vendor which protocol generates more tech-support calls.

In considering ease of use, bear in mind that Dr. Pepper has fewer features than AURP does and is less complex. This means that Dr. Pepper will probably have fewer gotchas — the types of problems unforeseen by designers, not experienced by testers, and found only from use in the real world. If you go with AURP, you should allow for extra time in your planning and debugging process to handle AURP's complexity.

Bear in mind that AURP versus Dr. Pepper doesn't need to be an either/or proposition. Although each type of external router, AURP or Dr. Pepper, can be paired only with another external router of the same type at the sister site, there's nothing to stop you from having both types of connections in your WAN wherever they make sense.

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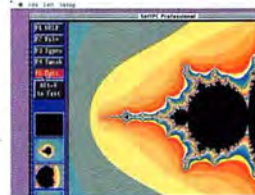
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CIRCLE 155 ON READER SERVICE CARD.

Apple Opens Up



Macintosh Easy Open makes the Mac open files it used to balk at — and opens the door to better system-level connectivity for PC users.

By John Rizzo

Who would have thought it: Apple is finally starting to build connectivity right in to its system software. "What?" you may say. "Hasn't Apple always stood for easy connectivity — plug-and-play and all that?"

Sure, but connectivity with other Macs (or with peripheral devices) and connectivity with non-Apple computers are two different things. Where cross-platform connectivity is concerned, Apple's system software hasn't been all that accommodating. For the most part, Apple's policy has been to leave the building of connectivity software to third-party developers — giving us Macs with floppy-disk drives that can read DOS disks and a Finder that can't.

This policy has turned around and bitten Apple, as the company has attempted to succeed in an Intel-dominated world. Without complete PC compatibility in the box, new Mac users (as well as potential first-time Mac buyers) don't realize just how PC-compatible the Mac can be. This ignorance keeps Macs out of PC-dominated organizations.

Confronted with this problem, Apple is moving away from its old leave-it-to-the-free-market policy and becoming more of an all-inclusive connectivity provider — taking advantage of System 7's expandability to add important connectivity capabilities on a basic level. These capabilities include the cross-platform QuickTime (QuickTime for Windows was released last fall); the soon-to-be-released Apple Open Collaboration Environment (AOCE), for E-mail and directory

services; and the recently released Macintosh Easy Open, a boon for file translation.

Unlike QuickTime, Macintosh Easy Open doesn't ship with system software. It's due to be added in the next major system release, but for right now, you can get it (free) only with new versions of certain file-translation programs. Along with Apple's other system enhancements, it's likely to help Apple's budget problems and narrow your connectivity deficit as well.

Software Socialism

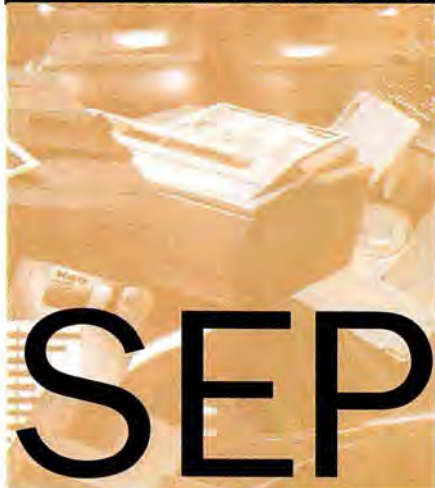
The more suspicious among us might smell software socialism in this strategy, in which the state provides everything, but quality and innovation suffer because of lack of competition. However, Apple's approach with Macintosh Easy Open demonstrates that it's possible to provide standardization and universal functionality in system software while still having third parties create vital pieces of the pie.

Macintosh Easy Open lets you open documents, including PC files or Mac documents, for which you don't have an application. But Macintosh Easy Open doesn't translate the documents itself; it helps the Finder give you a selection of applications and translators you can use to open the documents. The task of translation is left to applications that open other formats and to translator products that are Macintosh Easy Open-savvy, such as the latest versions of DataViz's

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Here's network news: The ZD Labs has put together a software solutions lab in a quest to find the most hassle-free network back-up solution. Four different high-capacity, streaming tape back-up solutions are tested on a 19-node Macintosh network for ease of use, interface, and compatibility features. Nobody gives buyers backup like MacUser.

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Who's got the most durable disk? 20 brands of floppies — well-known and generic alike — are baked, frozen, thrown, rolled over, magnetized, put through weather simulators and subjected to a multitude of grueling, technical tests. Plus: a preview of the new super floppy from Japan. MacUser gives buyers the hard facts.

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BRIDGES

MAC TO PC

MacLinkPlus/PC and MacLinkPlus/Translators; Mastersoft's Word for Word/Macintosh; Equilibrium Technologies' DeBabelizer; Kandu Software's CAD-Mover; and Apple's XTND translators, originally developed by Claris.

Read My Bits: No New Interfaces

Macintosh Easy Open provides the two essential ingredients of system-connectivity software: universality, or the ability to work with any program, and transparency, which means it works without adding another interface for users to learn. Because Apple holds the key to the Mac ROM, these are ingredients no third-party software vendor can provide.

Not that third parties haven't made attempts in the area of file translation. Claris tried to achieve universality and transparency when it developed the XTND translators (now owned by Apple), which worked from within an application's Save As window. However, they worked only within Claris applications and a few others (when Claris convinced the developers to add XTND). These translators also didn't work with the Finder. DataViz took a shot at transparency with version 6.0 of its MacLinkPlus products, which let you double-click on a DOS file from the Finder. However, double-clicking just opened the translation program and you had to take things from there.

With Macintosh Easy Open installed as an extension to System 7, the process is much less complex; the Mac knows which Mac and PC formats are supported by the applications and translators you have on your hard disk. If you double-click on a file created with an application you don't have, Macintosh Easy Open looks for another way to open the file. For instance, if you double-click on a file in Adobe Photoshop's native format but you don't have Photoshop on your hard disk, you won't get the usual "application could not be found" message. Instead, you might get a window displaying a list of applications that support the native Photoshop format, such as Color It!, from Timeworks. Click on a supporting application, and the file opens. Of course, you could have opened the file with Color It! right from the start, but only if you'd known that Color It! supported the Photoshop format — and if you'd known that that's what format the file was in.

In addition to showing you which other

applications can open a file for which you don't have the creator application, Macintosh Easy Open lists any translators you have available for opening it. For instance, if you double-clicked on a WordPerfect for Windows document, you might get a choice of translating the file with WordPerfect for Macintosh or using whatever translators were on your hard disk (MacLinkPlus or XTND, perhaps) to convert the document to WordPerfect for Macintosh or other formats, such as Microsoft Word.

Once you've chosen the translation you want, the file is converted and opened in the application you selected. If you don't like the results — perhaps because the translator you chose lost some formatting — just quit and start again with another translator. The original file is always retained. If you try to open the same type of file later, Macintosh Easy Open remembers the last translation you used and highlights that translation in the selection dialog box.

Like XTND, Macintosh Easy Open also works from within applications. When you issue the standard Open command in an application, you get a list of all the files, not just those the application can open. "So this is a feature?" you might ask, as you scroll through the hundreds of files on your hard disk. Well, sort of. It does let you select foreign files, ordinarily unavailable in the Open window, but you can't narrow the selection when you want to.

Drag and Convert

Macintosh Easy Open makes it possible to translate documents without opening them. To translate a group of documents to the format of a particular application, you can select the documents in the Finder and drag and drop them on top of your application. A list of translators specific to the application then pops up.

You can also create a script, called a document converter, that automatically translates files to a particular Mac or PC format, using the translator package, application, or technology you specify (such as MacLinkPlus or XTND). To set up a document converter, double-click on Macintosh Easy Open's converter file and choose a format and translator. Macintosh Easy Open changes the name of the document-converter file you've created to indicate the destination file format — for example, "to WriteNow

Document." To translate a file to that format, just drag and drop it on top of the document converter. If the file is in a format your specified translator can handle, a new converted file appears, with the original filename followed by "(converted)." You can also drag and drop multiple files simultaneously, but the files must be of the same type.

Proliferatin' Info

When you boot your system with Macintosh Easy Open, System 7 collects detailed information about the file type of each document on your hard disk. This information adds 2K to 3K to each file's size. You might think that these tiny file expansions could add up to a couple of megabytes if you had a thousand or so files on your hard disk, but the actual cumulative effect is much less. The reason is that files on hard disks don't always fill up the blocks that are assigned to them, so some of the Macintosh Easy Open data will fit into this ordinarily wasted space.

All this information collection and storage has a plus side: You get more information about files in the list (non-icon) views of folders. Normally, the Finder presents fairly generic information in the Kind column — for example, "Excel document" or just "document" for PC files. Macintosh Easy Open tells you much more, with Kind information such as "Excel Toolbar," "StuffIt Archive," or "AppleLink Package." And PC documents are identified by their applications — "WordStar Document" and "WordPerfect PC," for example. This extra information in the list view remains even when you turn off the translation in the Macintosh Easy Open control panel.


Don't Stop Thinking

Macintosh Easy Open gives Mac users the foreign-file ease of use they've long deserved (although it still needs to be built in to every Mac, not just made available with third-party programs).

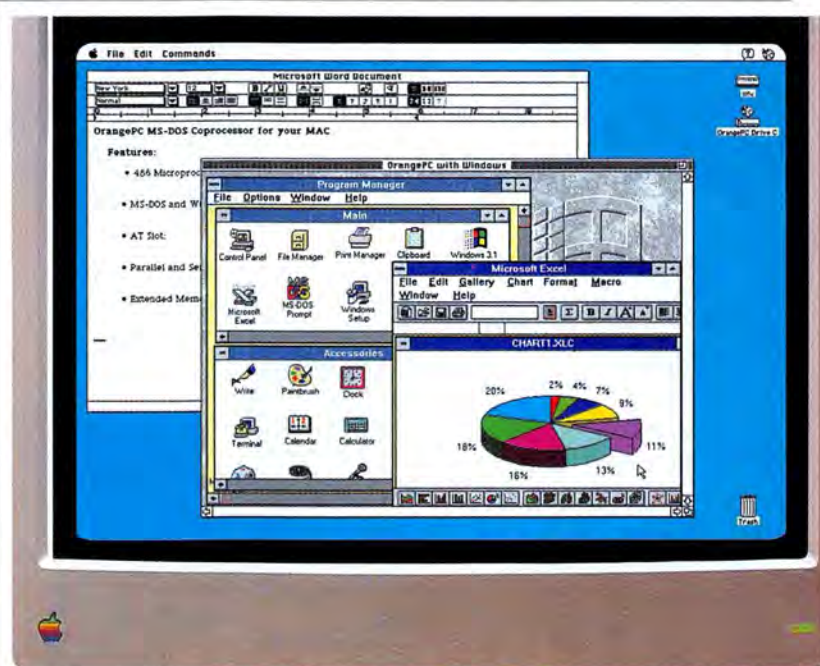
Let's hope Apple maintains its momentum and gives us more of the connectivity features we need at the system level. A built-in DOS-disk-mounting utility is obvious, something Apple should have had when it introduced Macintosh floppy-disk drives that read DOS disks. We could also use a built-in extension that let Macs read the IPX protocol, so that Macs could connect to Novell NetWare servers simply by plugging in

to a NetWare network. And while we're at it, how about AppleTalk Remote Access for PCs, so we can use PowerBooks to dial in to desktop PCs.

Of course, we do have to be careful of what we ask for here. Do we really want

a Windows version of Macintosh Easy Open with the acronym MEOOW? 

John Rizzo, a *MacUser* technical editor, is the author of *MacUser Guide to Connectivity*, published by Ziff-Davis Press.



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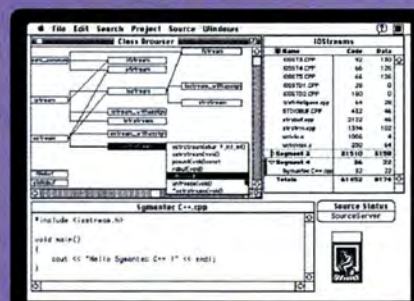
BackBurner is the distributed network renderer for Infini-D. Run BackBurner alone, or add an unlimited number of BackBurner Engines and watch the magic of parallel processing turn up your rendering time!

GRA0436 \$105*
Publisher: Specular
International

\$105*

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Publisher:
Symantec
LNG0062

\$345

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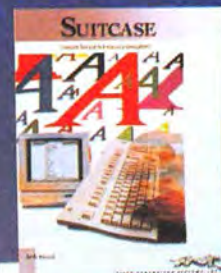
Suitcase by Fifth Generation Systems lets you organize your growing collection of fonts, DAs, F-Keys and sounds into any number of separate "suitcase" files outside your already bogged down system file. So your computer will operate at peak performance, unhindered by the bloated system that can slow things like application launches down to a crawl.

Monotype 57 Fonts

is a collection of 57 of the best PostScript typefaces money can buy—all original designs from the world-renowned Monotype Typeface Library—not cheap imitations. (Publisher: Monotype)

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Kaboom! is 150 wild and wacky sounds that you can add to the everyday functions of your Mac. Amaze your friends and colleagues with the sounds of traffic jams, screams, and ringing phones—even famous sound bytes from "Twilight Zone," "I Love Lucy," Ronald Reagan and more! Never settle for a simple beep again! (Publisher: Nova Development)



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● Cachet, Editor's Choice for "Software Product of the Year" -MacUser, lets you edit desktop color images in a remarkably intuitive and accurate way by using your own eyes! With Cachet's unique Edit-by-Reference feature, you'll never make

another printing mistake because you adjust the on-screen colors of your image to match a reference image that has already been printed. Other features include MultiChoice, a quick way to correct color, EfiColor for matching color to any printer and more!

Publisher: EFI
GRA0432

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● Aldus IntelliDraw is the fastest, most innovative new drawing program—so unique that it actually does much of the drawing for you. Professional-looking technical diagrams, business or engineering graphics, architectural renderings, flow charts, org charts, space plans, logos, maps, forms, presentations and much more are all a snap to draw. Create symmetrical graphics instantly with the exclusive Symmetricon™. Ready-to-use clip art and smart templates, plus an instructional videotape, gets you started immediately.

Publisher: Aldus GRA0354
Also available: IntelliDraw
Competitive Upgrade
SID0028 \$99.

\$199



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● With version 2.0, the industry's first and finest font styling program gets even better! 120 dynamic effects, each modifiable thousands of ways. A new high-performance interface and full color support. Transform any PostScript, bit-mapped or TrueType font into exciting logos, headlines, flyers, stationery, etc. Use with any DTP, drawing, WP or paint program. Powerful, easy-to-use. DTP0062 \$99



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DTP0063 \$75*
Publisher: Postcraft International

\$75*

Wallpaper

● With the prize-winning Wallpaper decorator program for your desktop, you can jazz up your screen with large patterns in up to 256 colors, grayscale or black and white. Includes hundreds of desktop patterns, or create your own with Wallpaper's expanded tools. Just drag and drop patterns into place and try creation after creation. You can set Wallpaper to change patterns among

your favorites and/or create new patterns from any format. Recommended by the major Mac magazines.

Publisher: Thought I Could GRA0302

Also available: More Wallpaper-
594 more patterns! GRA0434 \$29
and Wallpaper Zebra Edition
GRA0461 \$37

\$37

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Publisher: Microsoft BUS0269

Also available: PowerPoint 3.0

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●STA0030 SuperANOVA	369.
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●BUS0188 Lotus 1-2-3 for Macintosh 1.1	299.
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●BUS0166 Microsoft Schedule+ 5 Pack	269.
●BUS0243 Microsoft Works 3.0	159.
●BUS0285 The Microsoft Office 3.0	475.
●BUS0269 PowerPoint 3.0	295.
●WRD0059 Word 5.1	295.
Pastel Development	
●BUS0266 Daymaker 2.0	79.
Round Lake Publishing	
●Legal or Sales LetterWorks	ea. 45.
Softsync Publishing	
●FIN0048 Accountant, Inc. 3.5	335.
●WRD0057 ExpertWriter	29.
Teleware, Inc.	
●FIN0087 M.Y.O.B. 3.0	109.
T/Maker Co.	
●WRD0060 WriteNow Workshop	85.
WordPerfect Corporation	
●WRD0041 WordPerfect 2.1	289.

COMMUNICATIONS & NETWORKING

Apple Computer, Inc.	
●NET0250 AppleShare 3.1	969.
●COM0131 AppleTalk Remote Access	149.
●COM0126 Macintosh PC Exchange	59.
Dayna Communications, Inc.	
●NET0125 DaynaPORT E/Z	269.

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●Retrospect continues to dominate the market for network backup, and for good reason."

MacWEEK, 1992 Diamond Award. Retrospect® 2.0 provides both incremental backup to protect daily work and true archiving to remove inactive files from your hard disk to a storage device. Advanced scripting and scheduling provide automatic, unattended backup to all desktop volumes.

Publisher:
Dantz
UTI0227

\$147

FolderBolt

●Protect your folders and applications from changes, copying or unauthorized access or use. It's fully integrated into the desktop and locking and unlocking is as easy as a simple shift click.

UTI0212 \$75



NightWatch II*

●If controlling access to the entire hard disk is your principal concern, NightWatch II is the answer. It protects you with powerful access and erasure features including various timed-locking and write-protect options.

UTI0262 \$89*

Publisher: Kent Marsh
Also available:
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UTI0338 \$129.

\$89*

Thompson Chain HyperBible v2.5



●Now, two Bible translations at one price—the KJV/NIV in parallel. More than just

a work-search program, the Thompson Chain HyperBible is the most comprehensive Bible software program available. HyperBible includes over 100,000 marginal notes, 7,000 topical references, journey maps, archaeological studies, character studies and more!

Publisher:
Kirkbride
Technology
HYP0042

\$99

●MOD0077 OPTIMA 96 for the Mac	399.
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●UTI0174 AccessPC 2.0	59.
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●COM0143 Mac 320-VT320 Emulator 1.1	95.
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●MOD0109 VFX V.32bis MacPack	279.

EDUCATIONAL & ENTERTAINMENT

Broderbund	
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●GRA0268 Kid Pix 1.2	35.
Centron Software, Inc.	
●ENT0289 CasinoMaster Deluxe Color Version	45.
●ENT0440 Crossword Creator	39.
Optimum Resource, Inc.	
●EDU0355 Stickybear's Reading Room	35.
Personal Training Sys. (Full line available)	
●Excel 4.0, Word 5.1, Filemaker Pro 2.0	ea. 49.
Software ToolWorks	
●MUS0092 Miracle Piano	349.

GRAPHICS & DESIGN

Abracadabra	
●CAD0032 Design Your Own Home-Architecture	59.
Adobe Systems, Inc. (Full line available)	
●FON0295 Adobe Type Reunion	39.
●FON0439 Adobe TypeStyle 2.0 w/ATM	127.
●GRA0371 Adobe Premiere 2.0	429.
●GRA0403 Illustrator 3.2 (w/ATM 2.0)	369.
●GRA0430 PhotoShop 2.5	549.
Aldus	
●GRA0305 FreeHand 3.11	395.
●GRA0279 Gallery Effects Vol. 1	129.
●GRA0354 IntelliDraw	199.

●GRA0112 SuperPaint 3.0	99.
●DTP0072 PageMaker 4.2	495.
●UPG0003 PageMaker 4.2 Upgrade	95.
●DTP0080 Personal Press 2.0	99.
Apple Computer, Inc.	
●GRA0347 QuickTime Starter Kit	149.
Claris	
●GRA0350 MacDraw Pro 1.5	275.
Dream Maker	
●GRA0105 Clippings Vol. 1 Business Images	69.
Fractal Design	
●GRA0412 Painter 2.0	279.
Graphsoft	
●BUS0184 Azimuth 2.1	299.
●CAD0024 BluePrint 4.0	219.
●CAD0030 MiniCad+4.0	595.
Gryphon Software	
●GRA0378 Morph	89.
Quark, Inc.	
●DTP0071 XPress 3.1	549.
Ray Dream	
●GRA0383 addDepth	125.
Softkey Software	
●FON0480 KeyFonts	49.
Softsync Publishing	
●GRA0366 Expert Home Design	29.

INPUT & OUTPUT

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●ACC0921 LaserWriter Toner Cartridge	89.
●ACC0922 LaserWriter 250 Sheet Letter Cassette	72.
●ACC0923 LaserWriter II Letter Cassette	65.
CoStar	
●INP0196 AddressWriter Envelope Printer	375.
Datadesk International	
●INP0174 Mac 101E Keyboard Platinum	129.
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●INP0231 Turbo Mouse (SE or II) 4.0	109.
Microtek	
●INP0246 Microtek ScanMaker II	929.
●INP0247 ScanMaker II XE	1239.
Mouse Systems	
●INP0132 Little Mouse ADB	74.
●INP0232 PowerPad	79.



InTouch 2.0

●InTouch is the easiest-to-use contact & time organizer available! Easily group, sort & list your contacts. Auto-dial. Take extensive notes. Print envelopes, labels, address books, fax cover sheets & daily calendar. Includes highly acclaimed Snap® utility that instantly finds & pastes addresses & prints envelopes from within any application. 4 mice (Mac/ser 2/93). Ideal for PowerBooks.

Publisher: Advanced Software
ITI0291

\$59

SuperMac	
●MON0224 20" SuperMatch Color Display	1599.

POWERBOOK PRODUCTS

Applied Engineering	
●ACC0833 Automobile Power Adapter	69.
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●ACC0840 Battery for Powerbook	59.

Morph™

●The hottest image effect of the nineties is now available on the Macintosh! Morph™ smoothly transforms one image into another, creating dazzling images and effects like turning last year's car model into this year's or a futuristic cyborg villain disguising itself as a valiant heroine. Morph™ is fast, easy-to-use, and is also QuickTime-savvy.

Publisher:
Gryphon
Software
GRA0378

\$89

CMG Computer Products

●ACC0837 Powerlock for Powerbooks	49.
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●UTI0297 CPU Connectix for Powerbook Utilities	49.
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●Universal PowerCache 33 MHz	399.
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Mass Microsystems	
●DRI0253 DataPak 45MB Removable	539.
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PowerUser®	
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●CHP0013 1 Meg SIMMs 100ns	55.
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●DRI0494 Pro 105 MB Drive	439.
●DRI0546 Pro 210 MB Maxtor Drive	639.
●DRI0549 Pro 40 MB Drive	379.
●BND0094 44MB Syquest Removable	479.
●BND0095 88MB Syquest Removable	599.
SuperMac Technologies	
●DRI0437 Spectrum/8.24 PDQ	899.

UTILITIES & PROGRAMMING

Abbott Systems, Inc.	
●UTI0113 CanOpener 2	59.
Aladdin Systems	
●UTI0302 StuffIt Deluxe 3.0	69.
Apple Computer, Inc.	
●SYS0004 System 7.1 Personal Upgrade Kit	79.
●SYS0003 All Ease	45.
Caere	
●UTI0293 OmniPage Direct	269.
●UTI0202 OmniPage Professional	549.
Kent Marsh, Ltd.	
●UTI0212 FolderBolt	75.
MAXA Corporation	
●UTI0353 Alert!	119.
MicroMat Computer Systems	
●UTI0285 MacKEX 2.0	89.
Symantec Corporation	
●UTI0151 Norton Utilities for the Mac 2.0	95.
●UTI0334 Symantec Antivirus for Mac 3.5 (SAM)	65.

Desktop Publishing Partner Pack

●Timeworks Desktop Publishing Partner Pack is a complete design and image editing studio. It includes Publish-It! Easy, a full-featured desktop publisher; and Color-It! a powerful, easy-to-use 32-bit color paint and image editing program; plus CD ROM versions of each with added clip art, photo images and fonts.

Publisher: TimeWorks
GRA0442

\$199



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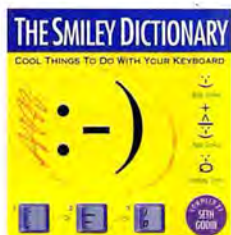
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PERSONAL MACINTOSH

Have a nice day: Emoticons, the typographical characters that represent smiles :-), winks ;-), and other nontextual communication have become an essential component of E-mail etiquette. If you want to get **up to speed on smileys**, you can now choose between two guides. Seth Godin's *The*



Smiley Dictionary, from Peachpit Press, comes with plenty of examples (did you know that 7:~] represents Ronald Reagan?) as well as coupons for sample time on CompuServe and America

Online. 510-548-4393. \$6.95. ♦ David Sanderson's *Smileys*, from O'Reilly & Associates, has 650 examples of typographic emoting as well as a tie-in smiley contest with a \$500 prize. ;-) 707-829-0515. \$5.95.

Famous-designer rodent: Quick, who's "the best-known designer of our time"? If, like the folks at Moustrak, you answered Luigi Colani, designer of "aeroplanes, cars, furniture, bathrooms," then you'll want to wrap your hand around the Sicos Colani Mouse. What sort of mouse does a man who **designs bathrooms** put his name on? Expect no frills (one button) and no thrills (no software), but you do get to choose between right- and left-handed models in two colors: plain-old platinum (shown here) and black, which of course *looks* faster. A small *M* on the bottom momentarily made me think that the Colani mouse came in different sizes (wouldn't it be great if you could buy mice in as many sizes as T-shirts?), but then I realized that the *M* stood for Macintosh. 702-884-1925. \$79. ♦ And where would a designer mouse be without a designer



mousepad? The Flatpad, from Mango Industries, has one significant feature: It stays flat. Stiff. Unbending. Not floppy. If your desktop (your *real* desktop) is as crowded as mine, you can just plop a Flatpad down on top of the papers and rev up your Colani. 415-328-9661. \$14.99.

Butterflies aren't free: But they're not too expensive either if you get *Butterflies of the World*, from REMedia. The first in a continuing series of ZooGuides (the next volume will cover whales and dolphins), the CD-ROM includes photographs of 250 **species of lepidoptera** from 15 families. An attractive interface provides access to educational information and some QuickTime movies. 619-549-8285. \$59.95. ♦



Another CD-ROM package that shows off the power of the medium is *Sightlines*, from DiscMore Productions. This two-disc set contains more than 24,000 photos relating to works of art and architecture (disc 1) and to the earth and earth sciences (disc 2). And every picture is in 24-bit format. 403-450-2734. \$295.

Less-is-more department: Two scaled-down products for PowerBooks: Wallpaper, the utility that lets you install **fancy desktop patterns**,

now comes in a special \$59.99 Zebra Edition, with hundreds of patterns designed for black-and-white screens. Already got Wallpaper? You can get just the black-and-white patterns for \$15. 212-673-9724. ♦ Kensington's NoteBook Traveler Compact is a PowerBook case that

isn't much bigger than the PowerBook itself, which makes it perfect for short trips or commuting. 415-572-2700. \$79.95. 🐘

By James Bradbury

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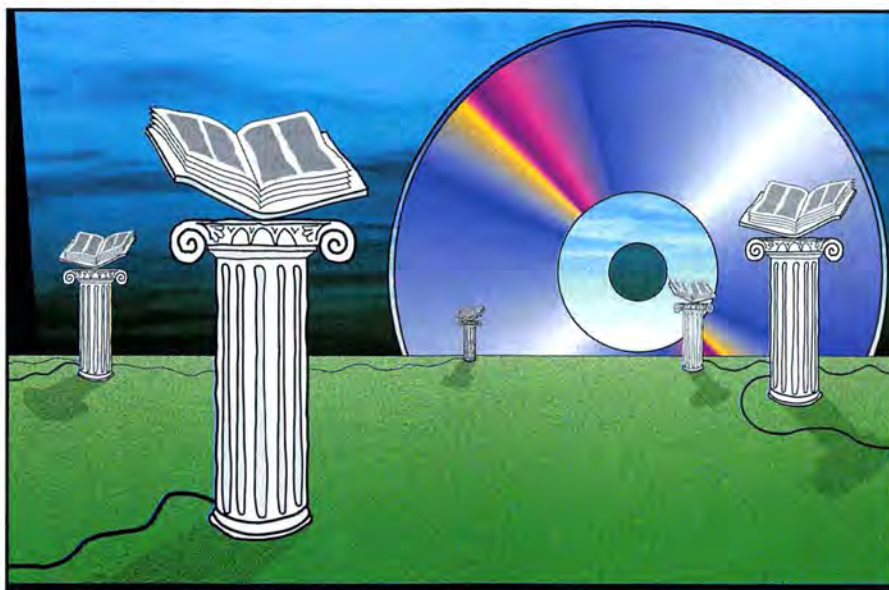
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CIRCLE 168 ON READER SERVICE CARD.



Things for Looking Up



Add the right tools — from encyclopedias on-disc to edutainment software — and your Mac becomes an incredible learning machine.

By Bob LeVitus

Putting reference works such as dictionaries and encyclopedias on a computer has always seemed like a great idea. Why, then, have so many attempts to do so resulted in mediocre products? Because, to be successful, an electronic reference must offer benefits, such as multimedia technology and search capabilities, you can't get from the equivalent paper-based version — especially because the paper version is usually cheaper (and doesn't require electricity). Until recently, I hadn't seen many electronic reference works that even came close to achieving that goal. But that's beginning to change, especially as CD-ROM packages start to enter the mainstream.

The New Grolier Multimedia Encyclopedia, for instance, is a CD-ROM that contains the entire 21-volume *Academic American Encyclopedia* — 33,000 articles (about 10 million words); thousands of pictures, illustrations, and maps; and hundreds of audio clips, video clips, and animated sequences.

The Grolier encyclopedia's interface is straightforward and easy to learn. A floating palette provides icons for different views, indexes, and search tools. The indexes use an outline metaphor. Every item — articles, indexes, pictures, movies, sounds — appears in its own movable, resizable window, so you can have several items on-screen simultaneously, arranged in any way you choose. If an article has an associated map, video clip, picture, sound clip, or animation, you can see that element with a single click.

Finding topics in the Grolier encyclopedia is easy. You can search for a word or combination of words. Every word on the disc is indexed, so search speed is good even on slower Macs, and the search options are simple but effective. There are also separate, searchable indexes for article titles, maps, video clips, sound clips, pictures, and animations.

In addition to searching, two other ways to explore the encyclopedia are available: the Knowledge Tree and the Timeline. The Timeline is a chronological list of events since the dawn of history. You double-click on any event to see a list of related topics. The Knowledge Tree is an outline based on six branches of knowledge: the arts, geography, history, science, society, and technology.

I have a few minor quibbles. The encyclopedia doesn't include enough multimedia segments — sounds, movies, and animations. And I'd love to see better keyboard support, as many commands can be issued only with the mouse. Finally, there aren't enough hypertext links. Although you can easily search for any word in the text, more hypertext links would make exploring even better and more rewarding.

From A to Z

Another good electronic reference I've recently looked at is the Random House Webster's Electronic Dictionary & Thesaurus College Edition. This one comes on floppy disks, and a full installation uses up about 8.5 megabytes of hard-disk

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PERSONAL MACINTOSH PERSONAL BEST

space. The Random House dictionary provides instant access to 180,000 words with definitions connected to 275,000 synonyms. It includes a DA and an extension file plus the required Definitions module and the optional Thesaurus, Pronunciation, and Etymology modules.

The dictionary can be accessed from within another program (such as your word processor) or used as a stand-alone application. When you launch the DA, a new menu called RHW appears in all open applications. When you look up a word, its definition or a list of its synonyms appears. Triple-clicking on a word in a definition or list of synonyms looks up that word. There are also definition (reverse dictionary) and wildcard searches and an anagram mode.

In general the program performed flawlessly both when used by itself and when used with Microsoft Word. I had some minor problems when I tried it with other programs, though. For instance, I couldn't get the Replace function to work at all with the Nisus word processor and when I used the dictionary with PageMaker, it didn't replace trailing spaces properly.

The Webster extension, which the program's installer placed in my Extensions folder, isn't mentioned anywhere in the manual or the Read Me files. The technical-support people (courteous but not toll-free) told me that the extension is necessary, although they couldn't explain why. They also didn't know why it wasn't mentioned in the manual.

Despite these minor flaws and foibles, I think the Random House dictionary program is quite useful, and I use it often. It's fast, relatively complete, and handier than reaching up to the bookshelf every time I need a definition. That qualifies it as a worthwhile electronic reference in my book.

No Value Added

For an example of a program where the added value of an electronic version is more questionable, consider Your Personal Trainer for the SAT, from Davidson & Associates. This package is supposed to help students get a better score on the all-important college entrance examination, the SAT (Scholastic Aptitude Test). Although it may deliver on that promise, so can many much less expensive how-to-take-the-SAT books.

Your Personal Trainer for the SAT consists of four main modules: Assessment, Vocabulary, Reading, and Math. The Assessment module is a practice test: Students read the questions in the included *How to Take the SAT* workbook and then answer them on-screen. The program tabulates the scores and prepares a personal training schedule based on individual strengths and weaknesses. Students can also compare their practice test scores with the national average or the average for a particular college or university.

The other modules — Vocabulary, Reading, and Math — are drills and skill-building activities based on actual SAT questions licensed from the Educational Testing Service. Students always have access to question-specific hints, test-taking strategies, advice from a trainer, and a glossary of definitions and formulas. Questions appear on-screen with a choice of five answers. With the pencil tool, students can cross out answers they know are incorrect before they select the correct answer, which is supposed to be a good habit. There's also a game — Block 1600 — based on SAT test-taking strategies.

Where an encyclopedia or dictionary can clearly benefit from the multimedia technology and powerful search capabilities a computer provides, Your Personal Trainer for the SAT doesn't seem

Table 1: Electronic References

	The New Grolier Multimedia Encyclopedia	Random House Webster's Electronic Dictionary & Thesaurus College Edition
List price	\$259	\$99
Company	Grolier Electronic Publishing, Inc. Sherman Turnpike Danbury, CT 06816 800-356-5590 203-797-3530	WordPerfect Corp. 1555 N. Technology Way Orem, UT 84057 800-321-4566 801-226-6800

to be significantly more effective than the equivalent printed book would be. Sure, it scores your tests quickly, evaluates your strengths and weaknesses, and includes a strategy game, but are those features worth two or three times the cost of a book? I'm not convinced. What's worse is that the program has some bugs. A book might not be as flashy, but it'll never hit you with a "not enough memory" or "Type 1" error either.

That's Edutainment

I've written about edutainment software here before. It fascinates me. When I was in school, computer-assisted learning was still science fiction. We did things the old-fashioned way — we read textbooks. Now, I'm not saying it's time to throw out the textbooks, but I really believe that learning a subject can be faster and easier if you also have interactive educational software that's fun to use.

A case in point is Fun Physics, an inexpensive subset of the Eddy Award-winning Interactive Physics II. Let's face it: Conventional physics instruction can be grueling. The subject matter is complex, and physics experiments are frequently difficult to perform or hard to visualize. By using Fun Physics, an interactive physics laboratory on-disk, students can observe dozens of included experiments on-screen or design and run their own experiments. It's easy, fast, convenient, and much more fun than classroom physics ever was. Knowledge Revolution, 15 Brush Place, San Francisco, CA 94103; 800-766-6615 or


415-553-8153. Version 1.2.0. \$99; site license for entire school, \$995.

For younger students, Swamp Gas Visits Europe is an animated interactive game that teaches them about European countries, capitals, cities, and famous landmarks. The graphics are beautiful; game play is engaging and entertaining;

and the maps are surprisingly up-to-date, considering the recent instability in Europe. Physical geography is learned by memorization, and memorization is usually boring. That's why Swamp Gas Visits Europe is such a stunning example of interactive edutainment software that makes learning easier and more enjoyable. In-

line Design, 308 Main Street, Lakeville, CT 06039; 800-453-7671 or 203-435-4995. Version 1.0.1. \$59.95.

Another exquisite edutainment program is The Geometric Golfer, a unique game that uses geometric transformations as golf clubs and geometric shapes as the ball and hole. It's the cleverest program of the bunch, taking a complex subject — geometric transformations (translation, reflection, dilation, and rotation) — and making it easier to understand and enjoyable to explore. Even if you think you hate geometry, you're likely to find the golf game addicting. MECC Software Development, 6160 Summit Drive N., Minneapolis, MN 55430; 800-685-6322 or 612-569-1500. Version 1.0. \$69.

All three of these programs work on almost any Mac, run in 1 megabyte (or less) of RAM, require a minimal amount of hard-disk space, and support black-and-white as well as color. If you or your child want to learn more about the laws of physics, European geography, or geometric transformations and want to have some actual fun while you're learning about them, Fun Physics, Swamp Gas Visits Europe, and The Geometric Golfer are just the ticket. 

Bob LeVitus was a student once. Since then he has written several books, including *Dr. Macintosh's Guide to the On-Line Universe* and *Dr. Macintosh*, second edition.

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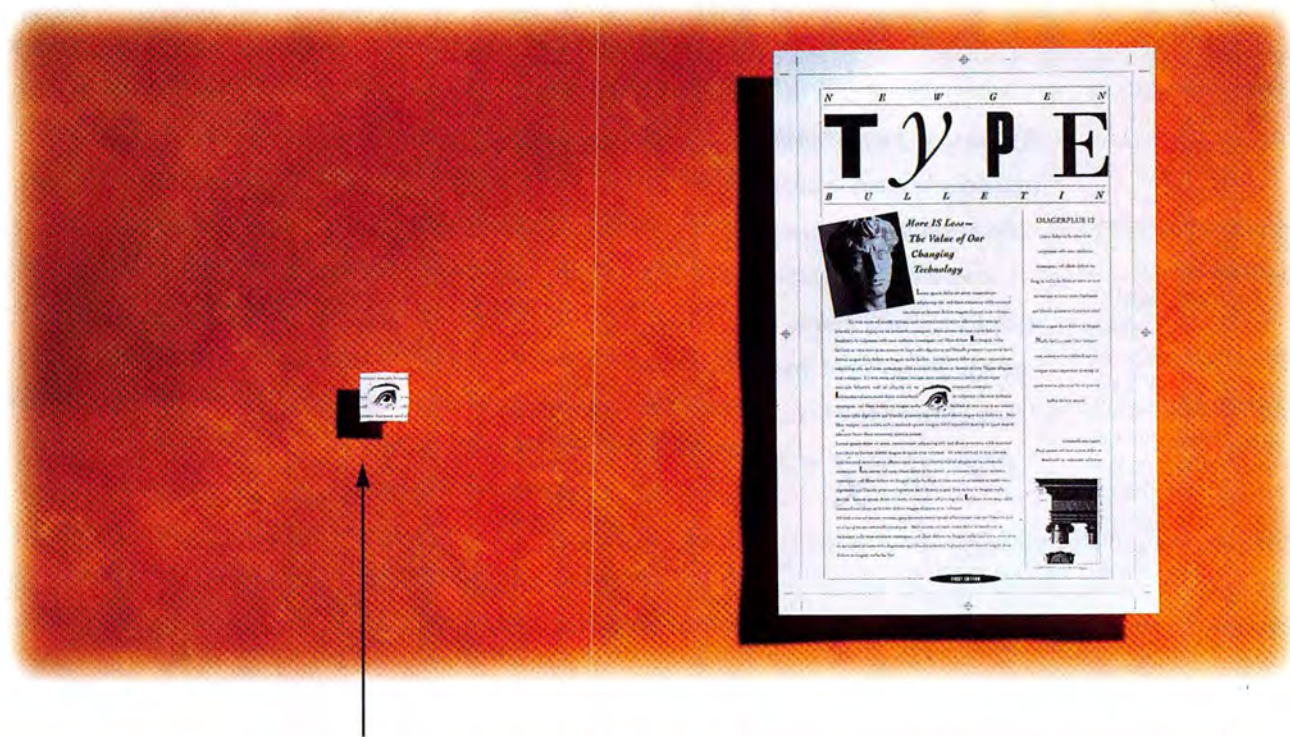
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Ten Ways to Longer Life



*Your battery can be the bane of your PowerBook existence —
unless you know how to take charge.*

By Henry Bortman

Batteries can be a real drain. I used to think Apple was outright lying when it said I could expect two hours of steady work from my PowerBook 170 battery. I could never seem to get more than 45 minutes out of mine.

But in a little more than a year of PowerBooking, I've learned a few tricks that have helped me keep my PowerBook up and running longer than I ever imagined possible — even longer than Apple's expectation. They are based on using a 170 and 180 and should therefore be applicable to the 140, 145, 160, and 165c models as well. PowerBook 100 and Duo 210 and 230 users may find that not all the solutions offered here are relevant.

① Condition your batteries. NiCad batteries, the kind used in most PowerBooks, suffer from something called a memory effect. If you partially discharge NiCads (say, for 20 minutes), recharge them, partially discharge them again (another 20 minutes), and then recharge them, they start to think they're incapable of holding more than a 20-minute charge. Conditioning forces the battery to discharge completely and eliminates the memory effect.

There are two ways to condition your PowerBook batteries: the dumb, cheap way and the smart, expensive way. The dumb, cheap way is to run your PowerBook off its battery until it literally shuts itself off. I don't mean goes to sleep; I mean off. Gone. Kaput. This is cheap, obviously, but it's dumb, because you probably have better things to do with

your PowerBook than use it as a conditioner for batteries.

The smart, expensive way is to get a conditioning charger. Unfortunately, Apple hasn't seen fit to market such an animal. Fortunately, Lind Electronic Design (LED) has. Its BC-4070 battery charger (\$89.95) has a conditioning option. Put your battery in and press the discharge button, and the charger will fully discharge your battery before it recharges it.

I try to condition my batteries once a week. The LED charger can do a deep discharge and a full recharge overnight. LED (612-927-6303) also sells the SBC-1 Supercharger (\$139), a conditioning charger that does the job even more quickly. If you haven't bought a charger for your PowerBook's batteries yet, don't buy Apple's, buy one of LED's.

② Give your processor a rest. The PowerBooks have power-management software and hardware that slow their processors down to a crawl when you're not working. The processors come back up to speed instantly when you move the mouse or type; you don't even notice they've been resting. The battery savings are tremendous. Automatic processor-resting is on by default. The only time you may want to turn it off is when you're using your modem. Leaving the processor-rest option on when telecommunicating (while running off your battery) can cause line disconnection.

③ Downshift your processor. Most PowerBooks let you choose between running at maximum processor speed (25 megahertz or 33 megahertz, depending on the model) or

reduced speed (16 megahertz). You use less juice when you run at reduced speed. With most applications, you won't notice the difference in the Mac's response, but you'll extend your battery's life by slowing the processor down.

④ Use a battery-management utility program. Such a utility can give you more flexibility than Apple's PowerBook control panel does for setting things such as disk spindown, backlight dimming, and system sleep. My favorite is CPU

(\$99), from Connectix (800-950-5880 or 415-571-5100).

A unique feature of CPU 2.0 is an automatic processor-speed switch. With the auto-speed switch activated, your PowerBook automatically goes into slow-speed mode when you're running off the battery. With Duos, it switches to slow-speed mode whenever you unplug the AC adapter. With the other PowerBooks, you have to restart to switch speeds, but CPU will automatically boot your PowerBook at the slower speed if you start up with the AC adapter unplugged.

⑤ Turn off your backlight. When a flashlight is on, you use up its battery. When it's off, you don't. Your PowerBook's backlight works the same way. If it's too dark to see your screen with the backlight off, turn it to the minimum brightness setting.

⑥ Spin down your hard disk. On most Macs, your hard disk spins all the time. But it takes energy to spin the disk, and that energy comes from your battery. The PowerBooks have software and hardware to stop the disk from spinning when it's not in use. If you use one of the battery-management utilities, you can set how long your PowerBook waits when the hard disk isn't being accessed before it puts the hard-disk drive to sleep. Anywhere from 30 seconds to 2 minutes is a good setting. Even if your software accesses the disk frequently and even though it's annoying to have to wait while the disk spins up, if you're trying to squeeze as much work time as possible out of your battery, your disk should be spun down except when it's reading or writing data.

⑦ Use a RAM disk. If you have enough memory to set aside a megabyte or two for a RAM disk, set one up before you embark on a long battery-powered session — such as a transcontinental flight — and copy to it the applications and documents you will use while the computer is unplugged. With well-behaved applications and a RAM disk, you should almost completely be able to avoid accessing your hard disk.

Of course, if the only copy of your files is on a RAM disk, you run the risk — if your Mac crashes — of losing hours of work. So stick a floppy disk into the PowerBook's internal floppy drive (sorry, Duo users don't have this option), and occasionally save the file to the floppy disk. Saving a file to a floppy disk puts only a minimal drain on the battery.

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⑧ Don't use Microsoft Word. The PowerBook-hostile Word is notorious for hitting the disk constantly. Such as when you press the Delete key. Or the left-arrow key. Or type more than two lines of text. Or click the mouse button. Even putting the Word application on a RAM disk doesn't alleviate this problem. Word frequently accesses special files that live within your Mac's System Folder.

Microsoft was sensitive to this problem when it released Word 5.1. It didn't do anything about how frequently the program accesses the hard disk, but it added a battery icon to the ribbon of formatting icons that sits at the top of Word documents, so you can see how quickly you're draining the battery. Thanks, guys.

⑨ Keep your spare batteries fully charged. Yes, I said *batteries*. If you run your PowerBook off batteries much of the time, you should have three batteries. You can go through two fully charged batteries, and then some, on a work-intensive transcontinental flight.

Another option is LED's APP-3 Auxiliary Power Pack (\$99.95). Instead of using NiCad batteries (or NiHy, if you're a Duo user), it uses plain-vanilla D cells. Eight of them. It's good for eight to ten hours of continuous PowerBook use. Of course, you have to throw the D cells away after you've used them. So this solution doesn't get the Earth First stamp of approval. But if you're in a cab on the way to the airport and realize you forgot to charge your PowerBook batteries the night before, you'll have the option of picking up some batteries at the terminal newsstand.

⑩ Get a Utilitron PowerSwap. One of the dumber things Apple did in designing PowerBooks — the now-defunct 100 was an exception — was not to include a small internal battery that could keep your PowerBook sleeping peacefully just long enough for you to swap out a drained main battery and insert a fully charged one. PowerSwap provides this function externally. It's a small adapter that plugs in to the AC-adaptor port of the PowerBook and to which you attach a standard 9-volt battery. You plug it in, put your PowerBook to sleep, swap batteries, and wake your Mac back up.

This nifty gizmo saves you from having to reboot. Rebooting isn't that big a deal, you say? It is if you followed Tip 7. It can take several minutes of precious battery-charge time to recopy all of your

application and document files to your RAM disk and then open and rearrange them on your Mac's desktop after shutting down and rebooting. PowerSwap saves you the trouble.

Batteries are a drag. But until some

genius comes up with battery technology that works a lot better than what we've got today, you'll live a far less stressful life if you take a few precautions. ☞

Henry Bortman is *MacUser's* technical director.

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MACINTOSH IIX	*			*								*	*	*
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CENTRIS 610, 650	*			*							*	*	*	*
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140/145/170	*	*		*		*						*	*	*
160/180/165C	*	*		*		*	*	*				*	*	*
DUO SERIES	*	*		*		*	*	*	*	*	*	*	*	*

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CLASSIC/25 MHZ	WITHOUT ACCELERATOR	WITH ACCELERATOR		
CLASSIC/40 MHZ	WITHOUT ACCELERATOR	WITH ACCELERATOR		
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How to Buy

Memory

■ To add more memory to your Mac, you need to install SIMMs (single in-line memory modules) on the motherboard. SIMMs come in a variety of sizes — 256K and 512K, and 1 megabyte, 2 megabytes, 4 megabytes, 16 megabytes, and 32 megabytes — and speeds — 150, 120, 100, 80, and 60 nanoseconds (the lower the number, the faster the SIMM).

■ What SIMM size and speed does your Mac need? You'll find all this information in Connectix's free booklet *The Macintosh Memory Guide*. Get a copy by calling Connectix at 800-950-5880 or 415-571-5100. The *Memory Guide* also fills you in on the mysteries of virtual memory and 32-bit addressing.

■ Unless you plan to upgrade eventually to a more powerful Mac, it's a waste of money to buy RAM that's faster than you need.

■ A few Macs have unique memory needs. If you want to install SIMMs larger than 1 megabyte in your Mac II or IIfx, you need special SIMMs. The Mac IIfx requires special SIMMs, no matter what their size. And if you're one of the few people who still has an old Mac Portable, note that there are different types of RAM for the backlit and nonbacklit models — if you can still find RAM for these Macs, that is.

■ PowerBooks use PSRAM (pseudostatic RAM), although the Duos use the same DRAM



*Adding memory will make your Mac faster,
and it will let you have more applications and
documents open at once without getting those
“Not enough memory” messages.*

(dynamic RAM) that's used in the SIMMs for desktop Macintoshes.

■ Because the Mac IIfx requires special RAM, before buying more memory, ask yourself how long you plan to keep this machine. This is especially important if you're thinking of adding a CPU accelerator. Some accelerators use the RAM on the Mac IIfx's motherboard, whereas others (the Radius Rocket, for example) use standard (30-pin) RAM that can be recycled for use in some other machines once you've upgraded.

■ The Centris machines, the LC III, and the Quadra 800 each use new 72-pin SIMMs (the old SIMM standard was 30 pins). These SIMMs have a special interleaving feature, which lets your Mac use RAM more efficiently. The advantage of the new SIMMs is that

you can upgrade one SIMM at a time, rather than having to fill a whole SIMM bank. You can also mix and match different SIMM sizes. The LC III supports 1-megabyte and 2-megabyte SIMMs; the Centris machines, the Quadra 800, and the LaserWriter Pro printers also support 8-megabyte, 16-megabyte, and 32-megabyte SIMMs. Older machines cannot use the new 72-pin SIMMs.

■ Don't expect a repeat of last year's radical decreases in the price of RAM. As the price of PCs has fallen and installation of memory-hogging Windows has increased, demand for memory chips has also risen, keeping RAM prices steady.

■ To find a RAM vendor, look in the back pages of this and other computer magazines and ask for recommendations


from your friends, user-group members, and even peripherals vendors.

■ A lifetime warranty is not necessarily a sign of reliability. Memory does fail eventually, so a two-year warranty is probably sufficient. You should get at least a 60-day warranty.

■ You can install SIMMs yourself, but by doing so, you may void the warranty of some Macs such as the PowerBooks and the Duos. Adding memory to a compact Mac (a Classic, Plus, SE, or SE/30) requires extreme care and the use of a special Torx T-15 screwdriver to open the case. If you don't feel comfortable installing SIMMs yourself in these Macs — even if they're no longer under warranty — budget an extra \$50 or so to pay a dealer to do it.

■ Ask about the company's replacement policy. Some companies ship out a new SIMM overnight as soon as you contact them; others wait until they've received the defective SIMM from you.

■ Ask what kind of installation advice you get with your SIMMs. Some large mail-order companies offer videos showing you how to install memory, some send written instructions, and others have telephone-support technicians who walk you through the installation process.

■ If you want more information on using and installing RAM, see "Maximum RAM," January '93, page 90. 

By Victoria von Biel

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- 5383 DoveFax PB 2.0.3 99.
- FWB, Inc.**
- 5567 hammerPB80... 449. 5568 PB120... 549.
- 11651 hammerPB210 669.
- ★ **Global Village ... 30 day MBG**
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- 5533 MDS 44 with free AutoDoubler..... **\$439.**
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- 5534 MDS 88 with free AutoDoubler **539.**
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- 10591 MDS 88c with free AutoDoubler **649.**
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- 11747 PBTools Competitive Upgrade 25.
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- ★ **Kensington ... 30 day MBG**
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- 10421 Deluxe PowerBook Case w/TOUCHBASE.. 75.
- 9585 Executive PowerBook Case 125.
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- 10934 Pro Modem 144i..... 259.
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- 5320 PowerModem 155. 6961 Pow.Mod. II 235.
- 7798 PowerModem III.... 329. 7786 IV.... 425.
- ★ **Sophisticated Circuits ... 30 day MBG**
- 7425 PowerPad.... 79. 7419 w/QuickKeys. 119.
- ★ **Symantec ... 30 day MBG**
- 1199 Norton Essentials for PowerBook..... 87.
- ★ **Targus ... 60 day MBG**
- 11207 Leather PowerBook Case..... 89.
- 1305 Universal PowerBook Case..... 69.
- 7369 Notepad 35. 6037 Premier Leather Case 169.
- Utilitron, Inc.**
- 3012 PowerSwap 25.
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- 10737 FaxModem PBK 92.

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- 8051 InTouch 2.0 55. 9049 DocuComp II 99.
- 11795 InTouch/Managing Your Money Bundle.. 65.
- ★ **After Hours Software ... 30 day MBG**
- 11558 TOUCHBASE PRO 3.0 49.
- 11557 DATEBOOK PRO 2.0..... 49.
- 11559 TOUCHBASE PRO/DATEBOOK PRO Bun. 89.
- Amaze, Inc.**
- 3582 The Far Side Daily Planner 2.0 39.
- ★ **Attain Corporation ... 60 day MBG**
- 8465 IN CONTROL 2.0 85.
- 11545 IN CONTROL 2.0/Dynodex Bundle..... 99.
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- 8881 Thunder 7 1.5.2 55.
- Broderbund Software**
- 3608 MacUSA ... 29. 3356 MacGlobe..... 34.
- By The Numbers, Inc.**
- 11658 RollCall (Church Management) 399.
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- Chena Software**
- 1594 Fair Witness 1.2 185.
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- 3903 ClarisWorks 2.0. 199. 11472 Upgrade 99.
- 3836 FileMaker Pro 2.0 268. 4752 Upgrade. 89.
- 1745 MacProject Pro.. 399. 3531 Resolve 169.
- 11202 MacWrite Pro 169. 11475 Upgrade 69.
- Contact Software**
- 7636 ACT! 249. 10317 ACT! Comp. Upgrd. 91.
- ★ **Dow Jones ... 30 day MBG**
- 1942 Market Analyzer Plus 2.04 225.
- Fisher Idea Systems, Inc.**
- 11721 IdeaFisher 95.
- ★ **Helix Technologies ... 30 day MBG**
- 1077 Helix Express 299.
- ★ **Inspiration Software ... 30 day MBG**
- 11269 Inspiration 4.0 159.
- ★ **Intuit ... 30 day MBG**
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- ★ **Microlytics** ... 60 day MBG
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- 11794 MicroProbe ADB..... 69.
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- 3669 Excel 4.0... 295. 5237 Upgrade 125.
- 4902 Word 5.1... 295. 1503 Upgrade 125.
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- 11189 Nisus Limited Flag Edition 3.4..... 239.
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- 2981 WillMaker 4.0 35. 1204 Living Trust 43.
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- SAS Institute**
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- ★ **Shana Corporation** ... 30 day MBG
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- 10832 Informed Foundation 299.
- ★ **Symantec** ... 30 day MBG
- 3422 More 3.1 265.
- ★ **SYSTAT** ... 30 day MBG
- 1230 FASTAT 2.0 399. 1231 SYSTAT 699.
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- 7736 Spiral 1.0 72.
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- ★ **Vertical Solutions** ... 60 day MBG
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- 10773 WordPerfect Works 1.2 special 119.
- ★ **WordStar** ... 30 day MBG
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- 4145 Adobe Premiere 429. 3199 Upgrade.. 149.
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- 10176 Fetch..... 199. 7541 IntelliDraw 194.
- 3506 SuperPaint.. 99. 4751 Persuasion 325.
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- 3572 Kid Pix 1.2.. 34. 7293 Companion 23.
- 1427 Print Shop... 35. 6281 TypeStyler 2.1 126.
- ★ **Claris** ... 30 day MBG
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- 11580 Special: 1-2-3 Mac & DeltaGraph Pro Bun. 99.
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- ★ **Expert Software** ... 30 day MBG
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7651 Action! Mac	349.
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11185 Toucan Press	49.
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7773 StrataVision 3D	599.



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7115 Publish It! Easy.....	109.
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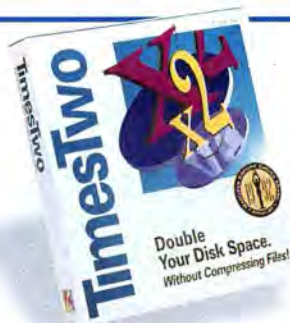
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1593 Drive 7 2.3	49.
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10595 Safe & Sound 1.0	37.
5041 MacTools 2.0	99.
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11205 Retrieve It!	60.
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3393 Pro	72.
5255 Retrospect..	147.
7945 Remote 2.0 ..	262.
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8562 Complete Undelete.....	31.
4803 Virex/Mac 62.	11486 SuperSet Utilities 93.
Delta Tao Software	
10755 WonderPrint	36.
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4287 PYRO! 4.01	27.
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11736 Screenscapes.....	34.
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11248 Alert! 115.	10772 Snooper (software) 129.
10771 Snooper 2.0 Hardware & Software Kit	179.
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5203 Help!	88.
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7761 *Voyager II, the Dynamic Sky Simulator*.. 99.
★ **Centron Software ... 30 day MBG**
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11188 *Pax Imperia*..... 30.
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★ **Great Wave ... 30 day MBG**
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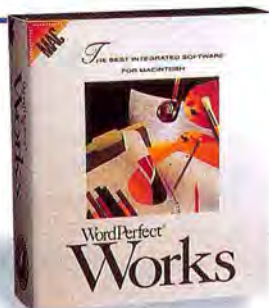
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Recharge it: Until Apple develops a solar-powered PowerBook, frequent fliers are reduced to searching for the smallest, fastest, and best ways to recharge those short-lived batteries. Lind Electronic Design has a few new options, most notably the Twin Traveler Charger (\$69.95), an easy-to-pack unit that lets you charge two PowerBook batteries, using the AC adapter while the PowerBook is still plugged in, so you can **keep working** while you're recharging your batteries. And for superfast charges, the SuperCharger (\$139) is designed to condition and charge the batteries as quickly as possible (it skips the trickle-charging common to other chargers). 800-659-5956 or 612-927-6303.

Finders keepers: If you want to find files more quickly, you'll need to get a commercial utility to replace the Find DA that came with your system software. There are a lot of them out there, but I'm a sucker for the newly upgraded shareware utility FindPro III; using this product is one of the speediest and most flexible ways to find files on your Mac desktop. You can configure the utility to launch when you press Command-F in the Finder. An added bonus: You can download FindPro III **free this month** from ZiffNet/Mac (*MacUser's* on-line service). See the masthead in this issue for details on how to get on-line. (By the way, AppleLink users can now download *MacUser* utilities as well as read the week's top *MacWEEK* and *PC*



WEEK stories and check out *MacUser* and *MacWEEK* product reviews. For more information, call the AppleLink Online Services HelpLine, at 408-974-3309.) ❖ Unfortunately, FindPro III isn't able to **search for text** within a document, which is often the easiest way to locate files. If you need that capability, take a look

at the \$39.95 Alki Seek (800-669-9673 or 206-286-2600) or the \$89 Retrieve It!, the first product Claris (408-987-7000) introduced under its Clear Choice label.

Print it: Here's an easy and inexpensive way to turn your trusty ImageWriter II into a color printer: Just add a four-color ribbon, install MicroSpot's MacPalette II 2.3 driver (\$69), and you'll be able to print **spiffy color pages** (by means of a color-dithering technique), even in the background. There's also an AppleTalk version of the driver, available for \$249, which lets you share your ImageWriter with other users. 408-253-2000. ❖ Do you feel like a lone Macintosh user in a PC world? GDT Softwork's PowerPrint/NW (\$499) enables you to access just about any PC-compatible printer on a Novell network. 800-663-6222 or 604-291-9121. ❖ You'll be able to squeeze **a little more life** out of your printer's toner cartridge if you use Working Software's Toner Tuner (\$49.95). This extension adds a control to the Mac's standard Print dialog box that lets you make lighter copies when you're printing draft pages. 408-423-5696. 



By Victoria von Biel

The Best Connections

Still trying to figure out how to use your modem and telecom software?

Here are eight ways to close the communications gap.

By Gregory Wasson

If you have a Mac, a modem, and telecommunications software, the world's your oyster. You can download free programs from an on-line service, send electronic mail to your pal in Texas, transfer DTP files to a service bureau — you can even stop battling traffic and telecommute to your job. But before you can do any of these wondrous things, you've got to figure out how to use that software.

Telecom software is notoriously hard to use, and setting it up for the first time can be a hit-or-miss affair. You have to specify such nonintuitive options as parity, data bits, stop bits, and

duplex. And once you've set the software up, using it can be frustrating unless you know a few secrets. Of course, you could slog your way through your software's manual, but to get you up and telecommunicating ASAP, we've translated the options you'll find in a telecom-settings dialog box (see below) into plain English. (Note that your telecom program will probably require you to make these settings in more than one dialog box.) Then read on for tips on the most frustrating telecom problems. If you're still trying to decide which telecom software is right for you, see "Making Connections," February '93, page 100.

Baud rate. The baud rate, sometimes referred to as bps (bits per second), controls the transfer speed. The bigger the number, the faster the transfer. Never set your baud rate higher than your modem or the remote system is capable of using.

Parity. The parity setting is an old form of error checking that ensures that a file has been transmitted properly. It's seldom used today. The setting should almost always be None, although some non-Mac systems may expect Even.

Data bits. This setting represents the size of each character in a transmission, so that the receiving computer knows how many characters have been sent. The setting is usually 8 for Macs; if you communicate with a mainframe or PC, you may occasionally use a setting of 7.

Stop bits. These are signals sent to the receiving computer to tell it that a character has been transmitted. The standard setting is 1, and it's unlikely you'll use any other value.

Duplex. The duplex setting controls whether you see on-screen what you type during an on-line session. The Full setting usually lets you see your typing. If it doesn't, change the setting to Half. You can make this change while you are on-line.

The image shows a screenshot of a 'Telecom' settings dialog box. The window has a title bar with the word 'Telecom' on the right. Inside, there are several settings: 'Use MacBinary format for:' with a radio button selected for 'All files except type 'TEXT''; 'Modem init command:' with a text field containing 'ATv1e'; 'Baud rate:' with a text field containing '2400'; 'Parity:' with a text field containing 'NONE'; 'Data bits:' with a text field containing '8'; 'Stop bits:' with a text field containing '1'; and 'Duplex:' with a text field containing 'FULL'. On the right side, there is a 'File' section with three radio buttons labeled 'Y', 'Y', and 'Z'. Red lines connect text boxes on the left to specific settings in the dialog box: from 'Baud rate' to '2400', from 'Parity' to 'NONE', from 'Data bits' to '8', from 'Stop bits' to '1', and from 'Duplex' to 'FULL'.

Setting	Value
Use MacBinary format for:	<input checked="" type="radio"/> All files except type 'TEXT'
Modem init command:	ATv1e
Baud rate:	2400
Parity:	NONE
Data bits:	8
Stop bits:	1
Duplex:	FULL

File
☐ Y
☐ Y
☐ Z

TIP Download Blues

The most common telecom problem is downloading a file, only to get an error message when you try to open it. There are two frequent explanations. First, you downloaded the file with MacBinary turned off, so the special MacBinary formatting was not stripped off when you downloaded the file. (MacBinary is the format that packages all the different elements of a Mac file so that it can be transferred intact, and it must be stripped off before a Mac can read the file.) You can download the file again with MacBinary turned on or use a utility that strips off the MacBinary envelope. StuffIt Deluxe, from Aladdin Systems, has a MacBinary translator built in; a shareware alternative is BinHex 5.0 (available in the Download & Support Forum of ZiffNet/Mac as file BINHEX.BIN, in Library 1).

The other possibility is that the file is compressed and you don't have an application for expanding it.

TIP Putting the Squeeze On

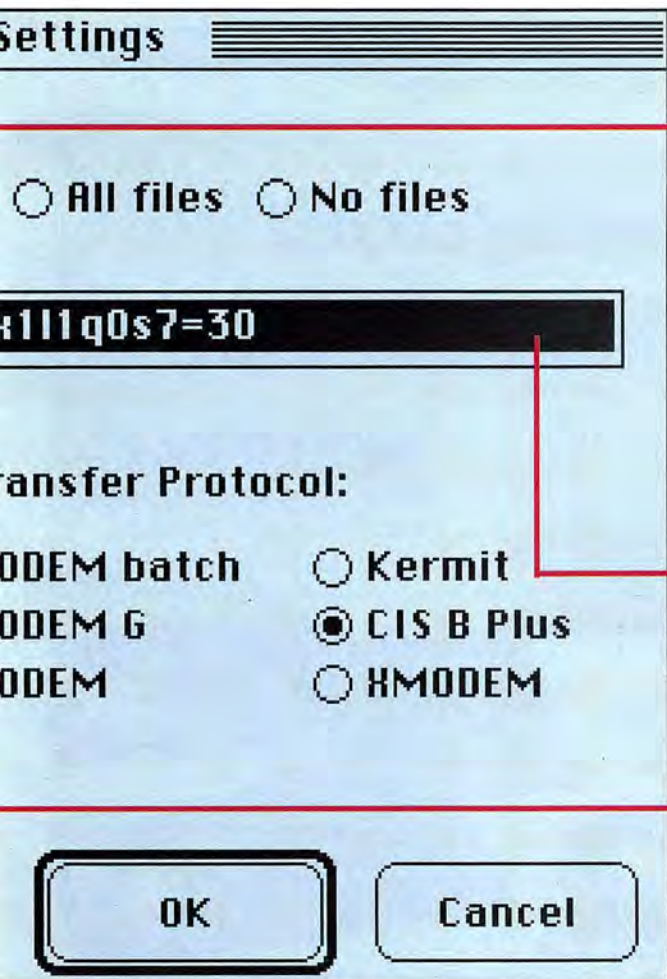
Files that are transferred by modem or made available through on-line services are almost always compressed so that they take up less space and take less time to transfer or download.

Once you have a compressed file (usually identified by the letters SEA, CPT, or SIT at the end of the filename), you must decompress it before you can use it on your Mac. StuffIt Expander, a freeware utility from Aladdin, decompresses files in Compact Pro, StuffIt, and AppleLink formats. It's available through all on-line services (filename STUFEX.SEA, in Library 1 of the ZiffNet/Mac Download & Support Forum). If you also want to compress files, you'll need the full versions of compression programs such as StuffIt Deluxe or the shareware Compact Pro.

TIP Person to Person

Although many people transfer files exclusively through on-line services such as CompuServe or America Online, you can also transfer files from Mac to Mac (for example, to send a file from a remote computer to someone in your office). You'll need to talk to the person on the other end first so that you can agree on common settings for bits per second, parity, data bits, stop bits, and protocol. Unless you make these prior arrangements, you may be in for a frustrating experience.

Decide whose modem will be calling and whose receiving.



MacBinary format. On the desktop, a Mac file appears to be a single file, but it is actually composed of several parts. The Mac's Finder represents these parts as a single icon, but this file structure confuses non-Mac computers. Mac telecom programs bypass this problem with a setting called MacBinary, which fools non-Mac computers into accepting Mac files. Think of MacBinary as a sort of envelope your telecom software uses when transferring Mac files through a modem. Make sure the MacBinary setting is turned on whenever you upload or download Mac files.

File Transfer Protocol. When you get ready to transfer a file, you must also select a transfer protocol. Both your Mac and the remote computer or service must be set to the same protocol before you can download or upload a file. The most universal protocol is Xmodem. Try it first, and then move on to the more advanced alternatives such as Zmodem or QuickB Plus (CompuServe only). Kermit is not a commonly used Mac protocol.

Modem init command. A modem-initialization string is composed of commands from the Hayes AT Command Set — codes for setting up various options of your modem (what feedback you get when you connect, which telecommunications protocol you're using, and so on) prior to an on-line session. These strings look nonsensical, but the good news is that many Mac telecom programs automatically insert the appropriate AT commands based on the type of modem you tell the program you're using. The manuals of most Hayes-compatible modems include a printed list of AT commands, so if you do need to customize the string, you can. (Call tech support if you need help.) Just remember that the string always begins with the letters AT (as in ATtention!), which tells your modem to process the rest of the line as commands. You can see all the current settings for your modem by launching a terminal-emulation telecom program, typing AT &V, and then pressing Return. The settings should be displayed on-screen.

The person whose modem will be receiving the call should launch a telecom terminal program and configure it to auto-answer (there's often a menu command for this). The modem will then answer the incoming call, and you'll be able to type messages back and forth or send and receive files.

TIP PC or Not PC

Some people use a PC at work to download Mac files and then transfer those files to their Mac at home. But — surprise! — the files don't open. Again, the likely culprit is MacBinary. PC telecom programs don't understand MacBinary format, so when you download a Mac file to a PC and then bring it over to your Mac, the MacBinary envelope is still there, and you must find a way to strip it off.

TIP It's in the Script

Most Mac telecom programs with a terminal-emulation interface, such as Hayes' Smartcom or Software Ventures' MicroPhone II, offer scripting features,

which let you do such things as automatically retrieve electronic mail or download files from an on-line service and then log off. Although scripting can look complex, don't let that keep you from taking advantage of this powerful tool. Programs that have scripting options almost always include a learn mode that makes the program actually write the script for you as you perform the manual actions you want to automate — no need to learn scripting commands or complicated syntax.

TIP Quicker CompuServe


CompuServe or ZiffNet/Mac subscribers should use CompuServe's CIS B Plus file-transfer protocol for downloads, because it can cut download times in half. CompuServe's Navigator and CIM (CompuServe Information Manager) use this protocol as the default. In a terminal program such as ZTerm or MicroPhone II, you must select CIS B Plus as a setting.

Unfortunately, MicroPhone's implementation of CIS B Plus can be unreliable. If you use MicroPhone II or if your

terminal program does not support CIS B Plus, a great alternative is Raymond Lau's shareware QB DA. On ZiffNet/Mac it's available as file QBDA.SIT, in Library 2 of the Download & Support Forum.

TIP Put Call Waiting on Hold

If you have call waiting active on your telephone line, you must deactivate it before you begin an on-line session. You do this by adding *70 before the telephone number your modem is to dial — for example, *70,408,555-3478. The code varies from *70 in some locales, so check with your local phone company.

Once you've come to grips with using your modem and telecom software, it's time to have some fun. There's a wide world of information — and a convenient alternative to faxes and phone calls — waiting for you. 

Contributing editor Gregory Wasson is the author of *The MacUser Guide to Shareware* (Ziff-Davis Press) and a sysop on MacUser's on-line service, ZiffNet/Mac.

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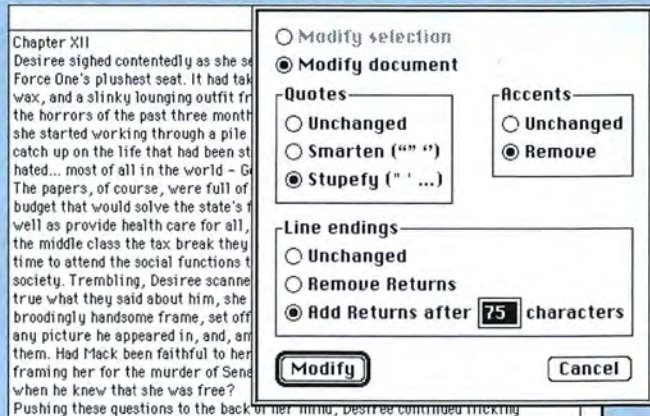
CIRCLE 122 ON READER SERVICE CARD.

TIP The Write Stuff

On-line services or bulletin-board systems that rely on a DOS-like command-line interface usually make writing and editing messages on-line very difficult, because you must use awkward commands that are foreign to most Macintosh users — if you've ever accessed CompuServe through a terminal-emulation program, you're all too familiar with this dilemma. But you can avoid the problems involved with on-line editing by using a text editor such as Baseline's Vantage or the

shareware program miniWRITER (see figure).

The secret to easy on-line message writing is to keep the text editor open in the background and compose your messages in it, editing them as you normally would in a Mac application (using cut-and-paste and so on). When the message is ready, just copy it to the Clipboard, switch to your telecom session, enter the service's message-composing mode, and paste the message in.



The shareware DA miniWRITER lets you strip out smart quotes and accented letters, which most on-line services cannot accept, and makes it easy to keep each line to a predetermined length — important because some on-line services can't display more than 80 characters per line.

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CIRCLE 47 ON READER SERVICE CARD.

Upgrading the

Mac IIx

Once the top of the Mac line, the IIx is still a sturdy — and fast — machine with plenty of options for upgrading.

Until the introduction of the Quadra series, the Macintosh IIx was the fastest Mac you could buy. Its vital statistics are impressive, including a 40-megahertz 68030 CPU; a math coprocessor; a fast, built-in 32K RAM cache; dedicated input/output (which takes some of the load off the CPU); and a special SCSI controller.

All this makes the IIx fast — on paper, at least — but it also makes it the quirkiest Macintosh Apple has ever produced, and you have to take its unique configuration into account when you upgrade.

Take SCSI, for example. As with any other Mac, you can

attach as many as six external SCSI devices to a IIx. However, the unique SCSI configuration requires that you use a special black terminator included with the IIx (if you bought your IIx secondhand and don't have the black terminator, you can get one from any computer dealer). In addition, if you have any SCSI devices that are *internally* terminated (certain scanners, hard drives, or tape systems, for example), the internal termination must be removed.

Theoretically, the IIx's special SCSI/DMA (direct memory access) controller should give you transfer rates as high as 3 megabytes per second with a high-speed drive. However,

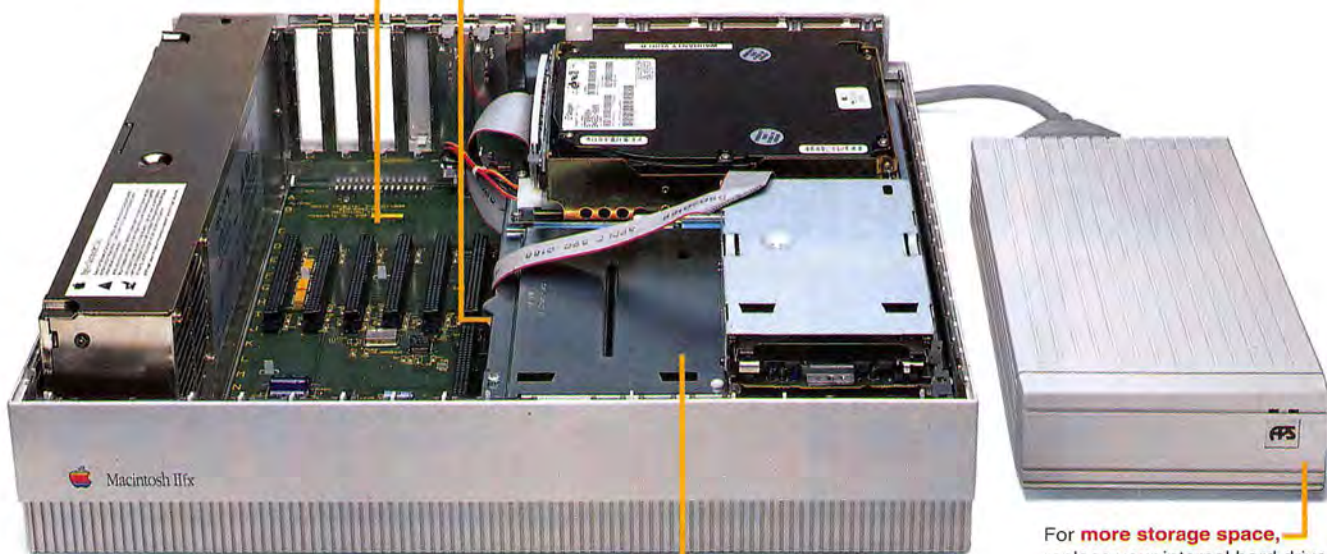
By Tom Petaccia

The IIx has six **NuBus slots**, so you can add a video-capture board, a Fast SCSI-2 card, or a 33-megahertz 68040 CPU accelerator to achieve Quadra-like speeds.

Add **more RAM**. The IIx has eight SIMM slots divided into two banks of four slots each, so upgrades must be done in groups of four. Also, the IIx uses special SIMMs that cost slightly more than the SIMMs used in most other Macs.

The IIx has room for a **second internal 1.44-megabyte SuperDrive**. Apple offers an internal SuperDrive, but mail-order firms, such as River Computer and Shreve Systems, sell new and used units for less than Apple does.

For **more storage space**, replace your internal hard drive with a larger-capacity internal drive, add an external drive, or replace the internal drive with a larger-capacity unit and then buy a case from APS for the old internal drive so you can use it as a backup external drive.



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POWER TOOLS

THE MAC WORKSHOP


only those few people who run their system under A/UX can benefit from this controller, because neither System 6 nor System 7 can take advantage of it.

So if you want faster data transfer, you'll have to install a Fast SCSI-2 NuBus card, such as the \$795 Silicon Express II, from ATTO (716-688-4259), and a SCSI-2-compatible hard drive, such as a Nova XL 1000 (the 1-gigabyte model costs \$2,719), from Microtech (203-468-6223). This combination can give you a transfer rate as high as 10 megabytes per second — fast enough to handle even the most-disk-intensive tasks with ease.

**If you want faster data
transfer, you'll have
to install a Fast SCSI-2
NuBus card and a
SCSI-2-compatible
hard-disk drive.**

Surprisingly, for all of its speed enhancements, the IIfx's NuBus system is the same as that of a plain-vanilla Mac II. This means that some things (Ethernet or video accelerators, for example) actually run *slower* than on, say, a IIfx. In most cases, however, you won't notice much of a difference. The IIfx does include a PDS (processor-direct slot) that is twice as fast as the NuBus slot, but it's different from the PDSs on other Macs, so you'll find that except for a few accelerators, IIfx PDS cards are rare.

The IIfx has no internal video, so one of your six NuBus slots will be taken up by a video card. If you have a monochrome or gray-scale card, consider moving up to 8-bit color. Color can improve your productivity and make your screen more aesthetically pleasing. Simple 8-bit-color cards (256 colors) cost \$300 to \$700; 24-bit-color cards (16 million colors) start as low as \$700 and can go to \$2,000 and higher.

With all of its quirks, the IIfx is a good performer as it is. If you add RAM and get a larger hard drive, you can expect years of good service for less than \$1,000. But if you want to upgrade to Centris or Quadra 68040 speeds and video capabilities, you will easily spend \$3,500. For that price, you may as well buy a new, fully equipped Centris 650. 

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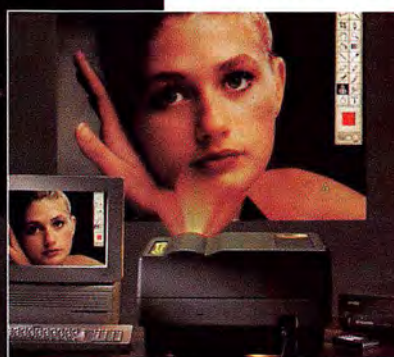


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How Butterflies Transform

The butterfly passes through several stages in its glorious transformation from egg to the completed creature that we all visualize as the butterfly. The adult female lays between one hundred and several thousand eggs throughout her lifetime each with the potential of becoming an adult butterfly itself.

Each egg, so tiny that it can only be seen by the human eye with the help of a microscope, is laid on or near a plant on which the newly hatched grub will be able to feed. These eggs are often green or yellow, but can also be found in shades of blue or red, each with a shell-like design covering it.

Usually in the spring or summer a tiny caterpillar, or grub, will hatch from the egg. This wormlike creature almost immediately begins to feed as it will consume the majority if not all of its nutrients during this phase of its life.

The caterpillar will continue to eat until it has eaten so much that its skin can no longer contain the newly acquired mass. The skin then bursts and the caterpillar will shed it in order to have it replaced by a newer and larger one. This process continues for weeks as the caterpillar increases in size, several times its original mass.

Often during the time of fall, the caterpillar will then either spin a silken pad from which it suspends itself by its hind legs or it will fasten its body upright by silken threads to a twig creating a chrysalis or exposed pupa. Usually after spending the winter months dormant, the final stage of transformation will take place.

The shell of the chrysalis is broken open and the creature that emerges is barely recognizable as the butterfly that it will become. Its wings are crumpled and kept close to its moist limp body. It will remain clinging to the cocoon or a nearby branch as its form gradually begins to become dry and firm.

It moves its wings slowly at first with little strength but as they dry it is soon ready to take flight. The creature that ascends into the air has been through its final stage of development and is now the completed butterfly. This butterfly is now called the imago, or perfect insect.

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TIP SHEET

Nobody ever said you had to live in Cupertino to be a Macintosh expert. Know-it-alls are everywhere, from Manhattan to Malibu — even in Waldport, Oregon, where we found our own Mac guru, Philip Russell. Each month Phil shares his own tips plus the best from the 70-odd Macintosh-user-group (MUG) magazines he reads each month. But Phil can't do it alone. To those whose undocumented Mac tip *MacUser* prints, we pay \$25, and the Reader Tip of the Month earns \$100.



Send your tip, together with your name, address, and phone number, to Tip Sheet, c/o *MacUser*, 950 Tower Lane, 18th Floor, Foster City, CA 94404.

You can also contribute tips electronically via



ZiffNet/Mac, the on-line service for *MacUser*. Send them to

Gregory Wasson at 72511,36. Be sure to include your full name and mailing address along with the text of the tip.

By Philip Russell

Reader tips compiled by Gregory Wasson

■ The Big Three bomb throwers:

1. You have more than one System file on a hard disk.

2. Some of your extensions and control panels are conflicting with each other.

3. You're still using System 6 and are attempting to run MultiFinder with too little RAM.

Bringing up the rear are viruses, which are not as common as you'd think.

■ No, no, no! Copying text to the Scrapbook and back out again in **PageMaker** (any version) does not necessarily make the text into a graphic — only if you copy with the pointer, not the text tool. If you use the Place command to place text in the Scrapbook, the text is a graphic.

■ Command-Option-Z in **Word 4.0** or later returns the cursor to its last location — letting you return to the insertion point after making a correction two pages back, for example. You can trace the last few cursor positions by repeating this keystroke. Or if you have a keyboard with a numeric keypad, use the 0 key on the keypad to chase the cursor around the screen.

■ Do you hate the shade of gray in your scroll bars? With **ResEdit**, open a copy of the

System file and then open the PAT resource. Open the light-gray pattern (ID=17), and go ahead and edit it. If you like your new pattern, replace the old System file with your edited copy. Note: Don't try editing the other patterns you see there.

■ Copying graphics to the **Scrapbook** returns them to their original shape in some applications, so if you screw up a graphic, you can copy it, paste it to the Scrapbook, and then copy and paste back into your document.

■ In **WriteNow 2.2** or later, try the Copy and Paste Font/Size/Style commands, on the Custom menu. Select some styled text, choose Copy Font/Size/Style, select the paragraphs to receive that style, and choose Paste Font/Size/Style.

■ If you like to scale **bit maps** (make them bigger or smaller), try doing it in a draw program — you'll get cleaner results.

■ Some applications, such as **Word** and **MacDraw**, have proprietary **clipboards**. That is why funny things happen when you copy in another application and then paste into one of those programs. If you run into this weirdness, paste to the Scrapbook and then

copy and paste out of it while in the suspect application.

■ A **DeskWriter** owner I know found that a document that should be on one page printed the last few lines on a second page. He fixed this by choosing legal size in Page Setup, even if he was not printing on legal paper. Everything then printed on one page. (Thanks, Gayle Lewis, of Neotsu, Oregon.)

■ How many boards can be used in a **Mac II-series** computer? Six? Well, there are six slots on the II, the IIx, and the IIcx! But the boards can't total more than 83.4 watts. The IIcx and IIci each limit you to 41.7 watts. (Thanks to *The NotePad*, Springfield, Illinois, MUG.)

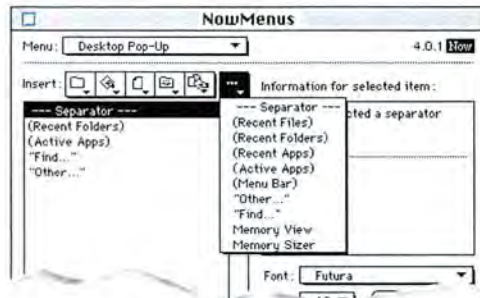
■ Does your **monitor** screen collect dust like a magnet? Wipe it with an antistatic cloth used for automatic clothes dryers. Try it first on a piece of plain glass or a corner of your screen. There are several brands with different amounts of chemical in them, so experiment. Use a clean, soft cloth on the screen after the antistatic cloth. (Thanks, Washington Apple Pi.)

■ If you are tempted by the ads offering a lot of **cheap PostScript fonts**, be sure that you look at the character sets.

Tip of the Month: NowMenus 4.0.1

When using the Desktop Pop-Up feature in **NowMenus**, if you inadvertently access the menu, you will select (and launch) the first item in the Desktop Pop-Up menu. To avoid this, simply go into the **NowMenus** control panel and insert a separator as the first item in your Desktop Pop-Up menu. Now if you inadvertently pull up the Desktop Pop-Up menu, you only select the separator and nothing happens.

Charlie Jones
San Francisco, CA



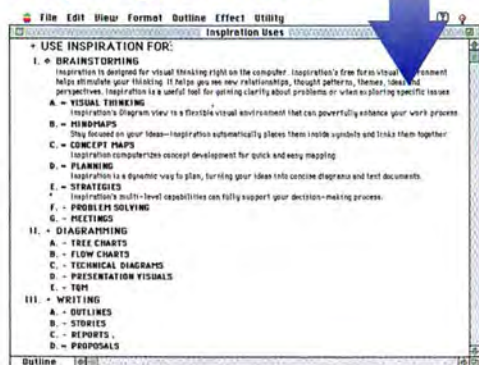


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POWER TOOLS TIP SHEET

Many such collections have only 25 characters plus the alphabet in uppercase and lowercase and numerals 0 to 9. For example, you won't get a bullet (Option-8) and many other symbols.

■ **Microsoft Works 2.0** databases sort only one field. To sort multiple fields, use a series of sorts. Sort the least significant field first. Example: In order to sort states alphabetically, ZIP codes within states, and names within ZIP codes, sort on names, then on ZIP codes, and finally on states.

■ If you have trouble lining up a tab in the ruler bar with the intended position, get **Nisus**. It shows you a vertical line on the page as you drag the tab, so you know just where the tab will be.

■ Where are the reversed-out numbers 2, 3, and 4 in **Zapf Dingbats**? The 2 is Option- and then Shift-A. The 3 is Option-N and then Shift-A. The 4 is Option-N and then Shift-O.

■ If you must open your compact Macintosh (Plus, SE, or Classic) and don't have a **case cracker** handy, you can substitute either a **large binder clip** (the kind with straight, not rounded, sides) or a 1-inch spring clamp. It works, but you should be very, very careful.

with a simple script that incorporates just one step: close.

2. In FileMaker Pro Preferences, select this script to be performed as soon as this data file opens.

3. Place an alias of this data file in the Startup Items folder.

Now, whenever you start up your Mac, FileMaker Pro will launch, opening the data file you just created. The data file will close after one or two seconds, and the startup process will continue, leaving FileMaker Pro in memory for later use.

Andrew G. Belivanakis
Chicago, IL

LaserWriter Pro 630

Although Apple's Pro 630 printer lets you print at 600 dpi and get good grays without resorting to using an imagesetter, PageMaker output will look as though it was printed from a 300-dpi printer unless you know this secret. Select as the target printer an imagesetter APD (Adobe Printer Description file) or the APD for any other printer that supports 600 dpi or higher. Print. You'll get a dialog box telling you to change the APD if you have trouble printing. Just click on OK, and go for it — it works!

PageMaker relies on APD files to use the more advanced features of your printer. So until an APD comes out for the Pro 630, this technique provides you with an easy workaround.

Kele McGlohon
Savannah, GA

Floppies

Take it from me, you ought to think twice about carrying unprotected floppy disks in purses and wallets. Aside from all the dust and dirt that collects in there, many purses and wallets have magnetic clasps that can damage a disk. Ever since the magnetic clasp on my purse scrambled the data on my floppy disks, I've

Reader Tips

FileMaker Pro 2.0

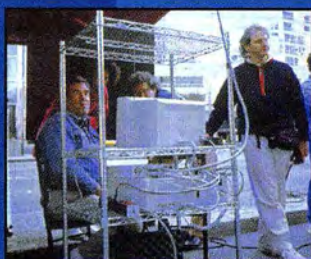
FileMaker Pro will launch automatically at startup if you place its alias in the Startup Items folder. However, you are then stuck with a FileMaker Pro dialog box prompting you to open a data file, and the startup process halts. If you just want FileMaker Pro to launch and stay in memory, follow these easy steps:

1. Create a FileMaker Pro data file with no fields but

a PLI case study:

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with Chris Callis:

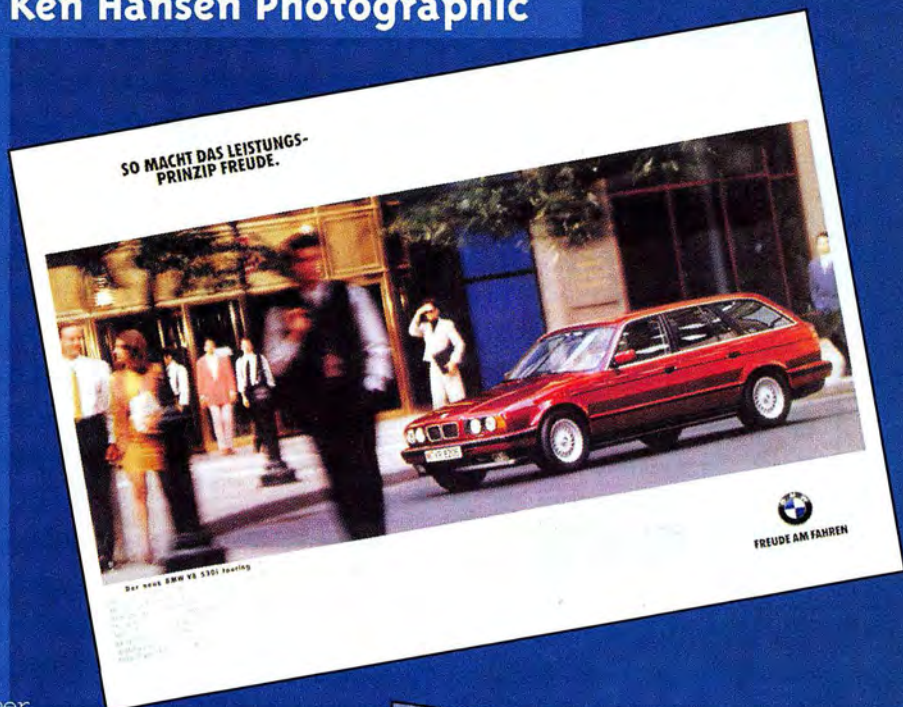


New York advertising photographer Chris Callis utilizes Macintosh™ based digital imaging in the creation of complex in camera photocompositions:

"In this particular series of shoots for BMW Europe I had six models, four stylists, two assistants, two truckloads of lighting, props, custom camera gear, and only one Macintosh equipped with PLI storage products. We used Kodak's DCS 200® digital camera to provide real time preview of what we were creating on film.

The client and I viewed the Macintosh screen to direct lighting and model placement via radio. On jobs like this, there is no chance for error and second rate equipment. I'm glad that I chose PLI storage products which have performed flawlessly...even on location using generator power!"

On buying equipment, Callis has some advice: "I buy all of my PLI and Macintosh gear from Ken Hansen Photographic. When it comes to imaging knowledge and support, the Ken Hansen crew run circles around any computer vendor, plus their prices are right in line."



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Sarah Meltzer
Watertown, MA

Nisus

You can keep style sheets and named rulers as a glossary entry, making them always available in any document. When you paste the glossary entry and then immediately delete it, the styles and rulers remain while the associated text is deleted.

Tony Armendariz
Gilroy, CA

System 7 Trash

For those who have a large monitor and hate dragging floppy disks and files all the way down to the Trash, here's a simple and useful tip: Drag the Trash icon straight up until it's close to your hard-disk icon but won't get in the way of floppy-disk icons. To find the right position, insert a disk in the floppy drive while you're positioning the Trash. That done, dragging a disk icon to eject it is a fast finger fidget, requiring neither arm movement nor aiming.

Franklin D. Sykes
Elkton, MD

QuarkXPress 3.1

When you are importing TIFF files into QuarkXPress that have images containing white space between objects, the objects have a tendency to get jaggy edges when the background selected for the file is None. To get clean images, select the background as Any color and the shade as 0 percent. The image will not be transparent, but those annoying jaggies will be diminished considerably.

Christopher Klonowski
Lisle, IL

PageMaker 4.2

Two tips that make using PageMaker easier: First, to check which PageMaker import filters and additions you

have installed, press the Command key as you select About PageMaker from the Apple menu.

Second, if you have multiple dialog boxes open, you can OK them all in one fell swoop by pressing the Option key when you click on OK in the first box.

Luis Muench
Miami Beach, FL

Word 5.1

If you indent a paragraph in which you've applied shading, the shading indents with the text. Here's how to keep the shading from indenting:

Select the paragraph. From the Insert menu, choose Text to Table. In the Insert Table dialog box, choose the Convert From Paragraphs option. Choose Paragraph from the Format menu. Under Indentation, type the measurement you want. From the Format menu, choose Border. In the Shading box, type or select the percentage of shading you want.

Karen R. Noel
Cincinnati, OH

Suitcase

You've just renamed your hard disk, and suddenly Suitcase can't find any of your suitcases. Here's what to do: Change the disk's name back to what it used to be, open all of your suitcases, and then quit Suitcase.

You can now rename your hard disk and go back and close those suitcases you don't need.

Andrew T. Laurence
Irvine, CA

ClarisWorks

Here's a quick way to get up and running in ClarisWorks and completely bypass the Open dialog box. First, open a word-processing file and set the font, point size, margins, and so on. Then, before you type anything, use the Save As command and

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POWER TOOLS TIP SHEET

find and open the Claris folder inside the System Folder. Name your file ClarisWorks WP Options, and save it as a Stationery file in the Claris folder. You've now created new default settings for the word-processing module.

Next, make an alias of the ClarisWorks WP Options file you've created and place it in the Apple Menu Items folder. To start up ClarisWorks with a new word-processing file, just select this alias from the Apple menu. Use the same process to create default settings for the other ClarisWorks modules.

Jeff Shaw
Buffalo Grove, IL

Photoshop

If you scan material that has a white background (for example, a line drawing), it

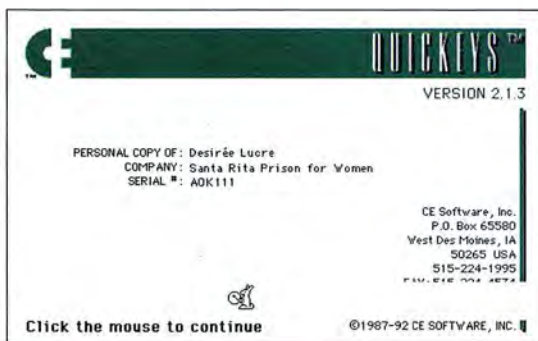
QuicKeys

There's comedy in QuicKeys if you know where to look for it. Open QuicKeys, and select About QuicKeys, on the Options menu. Wait about 30 seconds. Make sure you have the sound on.

Karsten Sethre
Austin, TX

can be difficult to know when the background on your scan is really clean. Sometimes "dirty whites" with rogue pixels show up only when you print a laser proof.

You can avoid this by leaving the Monitors control panel open. As part of the image-



editing process, briefly turn the screen depth to black-and-white (or even from 256 colors to 16). Any dirty-white areas show up as spots and are easy to remove by editing or by adjusting the brightness and contrast levels.

If you have QuicKeys, you

can use the ScreenEase extension to switch the screen depth. Or try the shareware utilities PixelFlipper and Switch-A-Roo (they're available from on-line services and user groups).

Doug DuBosque
Molalla, OR

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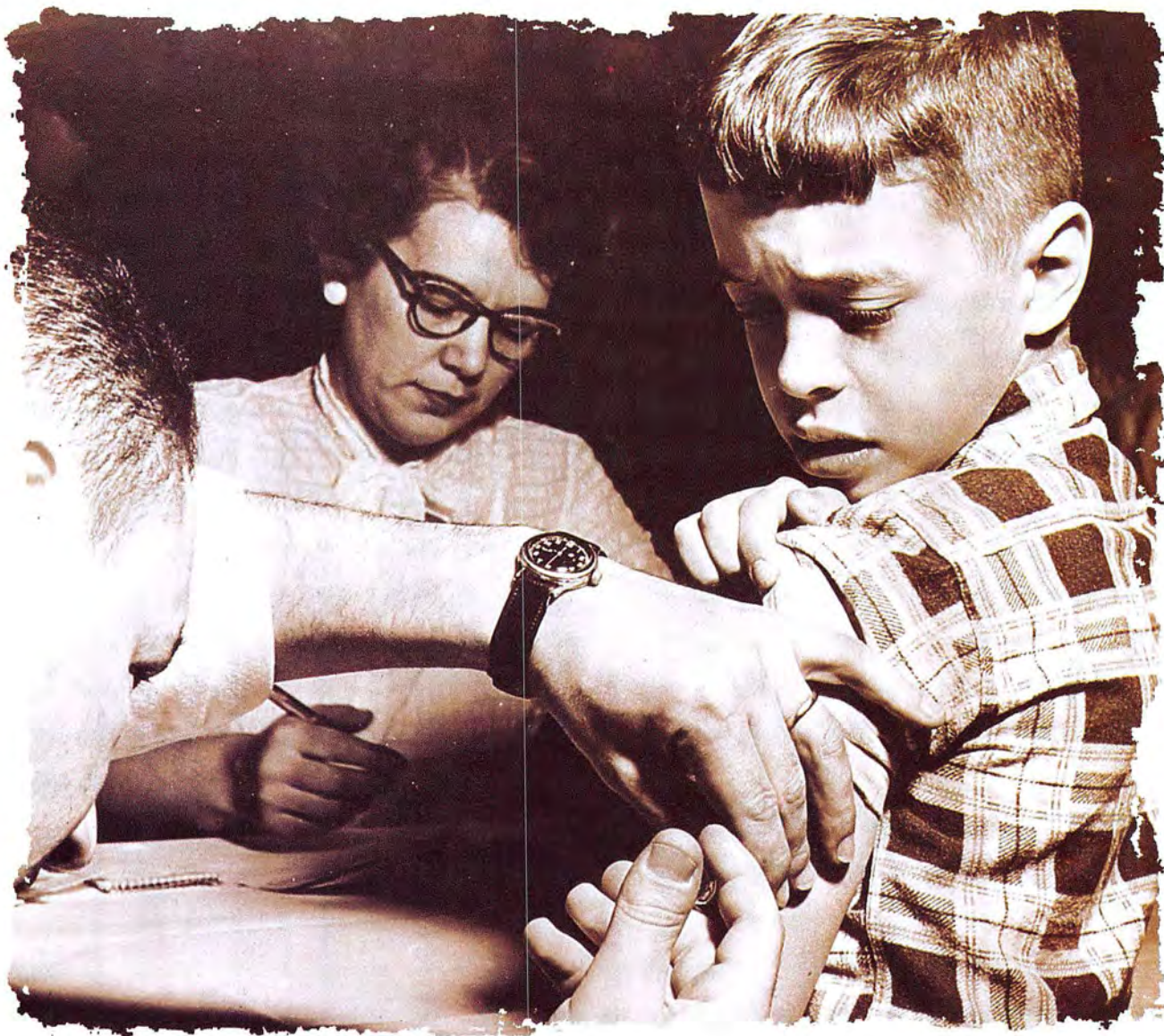
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Don't want to wait for an answer? Post your question on ZiffNet/Mac, MacUser's



on-line service, and get a reply from Bob (76004,2076), Andy (72511,204), or one of the other MacUser experts. See the masthead in this issue for instructions on how to sign up.

By Bob LeVitus and Andy Ihnatko

Return of the Dead Folder

Q. Ever since I installed System 7, I have been having difficulty with a folder called Move&Rename, which isn't visible in the Finder but appears in some Open and Save dialog boxes. I trashed this folder once, but it keeps coming back. On the advice of a Mac guru, I used ResEdit to try to remove it, but it still won't go away. Is there any way I can get rid of this pesky invisible folder? And if I do, will it cause any serious problems?

Juli L. Gioia
Ivyland, PA

Andy: First off, this "Mac guru" you dug up is full of beans. Was he or she wearing the official, motorized propeller beanie, by any chance? I thought not. Then again, some guru I am. The first time I set eyes on the Move&Rename folder, I thought I should take it literally, so I moved it to another folder and renamed it.

Anyway, I assure you, the invisible Move&Rename

folder is just one of those bizarre and frightening things that, inexplicably, is completely normal, much like many current celebrities I am not cruel enough to name here. Like the similarly semi-invisible Desktop files and Trash folder, the Move&Rename folder is just a folder the Mac uses for its own housecleaning (see Figure 1).

Specifically, it's used during file sharing for — you guessed it — moved and/or renamed items the Mac has to keep an eye on. Usually it's empty, so unless you vent your anger at a particularly bad moment, trashing the folder will do no damage. But it'll just keep coming back, like mildew in a shower. Unless you crave constant reminders of the

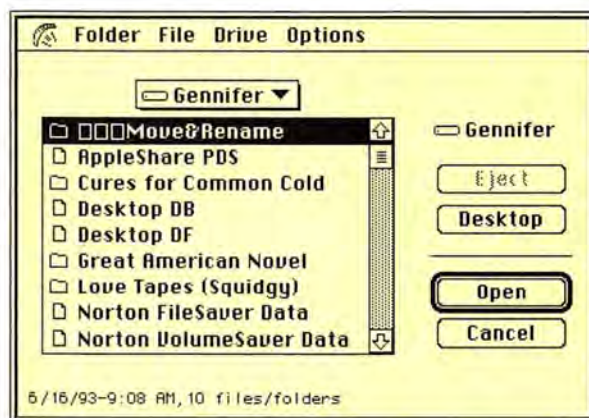


Figure 1: Haunted by the usually invisible Move&Rename folder? Rest assured that it's harmless, so don't even think about throwing it away — the system creates it when file sharing is turned on and uses it to keep track of files that are shared with other users.

*... But Were Afraid to Ask

Granted, the word *basic* doesn't always herald good news. Look at basic cable TV, for example. You get nothing interesting, unless you like to while away the hours watching people fish on TV. And *Basic Instinct*, although a real crowd-pleaser nuditywise, never even came close to the craftsmanship of plot and character development in *9½ Weeks*.

But here at Help Folder, we like to believe that turning our attention to at least one basic, simple question each month can do nothing but good to everyone concerned. So send those easy questions on in! To protect your identity, we'll say your question was contributed by the guy who manufactured George Washington's false teeth.

Q. Is there a way I can get my Mac to start up with an application instead of with the Finder? I'd rather be able to go right to my word processor when I start up, as I can with my DOS PC.

Dr. John Greenwood
New York, NY

Andy: Here's the easy answer: If you're running System 7, all you have to do is toss the objects of your affection or their aliases into the Startup Items folder inside your System Folder.

No matter what they are — applications, documents, control panels, sounds, whatever — they'll open automatically at the end of your Mac's startup process.

Question answered. But because I see I still have a couple of inches to go before I hit the bottom of the page here, I'll go for bonus points. If you have multiple items in your Startup Folder, the last item in the folder, alphabetically, will be the "active" (topmost) item when the Mac has finished starting up. So if you want to be able to start working in DiscoWriter without having to click LambadaDraw into the background, toss a tilde (~) in front of the former to force it to load last. Second, if you want your Mac to automatically reopen any documents that were open when you last shut down, you can use an Apple-menu manager such as Microseed's HAM to automatically reopen, the next time you start up, any documents that were left open when you shut down. Finally, because my Mac takes several minutes to start up (owing chiefly to the truly pathological number of extensions I've installed), I've made the last item to load in my Startup Items folder a sound file. This way, when I hear an unprintable quote from the fine film *Repo Man*, I know it's time to put down the comic book and get to work.

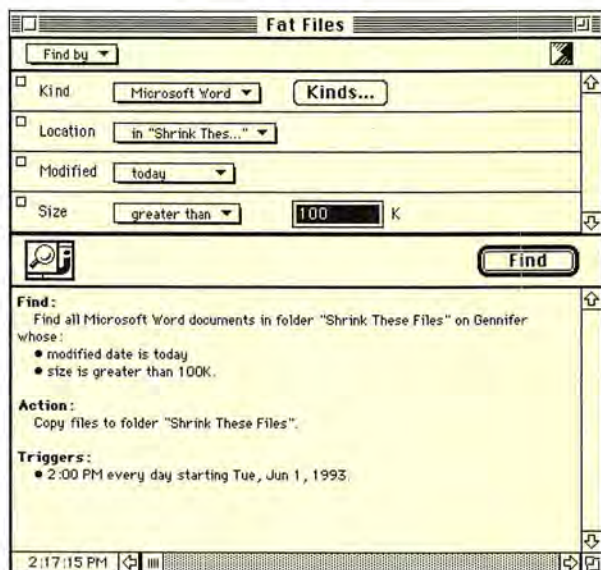


Figure 2: So you want to locate all of your porky Word or PageMaker files and then move them into one folder? Magnet, from No Hands Software, makes the job easy. Just specify key attributes (file kind and size, for example), and Magnet will copy or move the files to any location you specify or create aliases.

futility of humankind's struggle against the forces of entropy, just leave that folder where it is.

By the way, the Move&Rename folder usually has three boxes preceding its name, as shown in Figure 1.

Bob: My advice is to let this folder live. You may feel better after killing it off, but deleting it *can* cause unwanted side effects and since it's just going to reappear anyway every time you turn on File Sharing, deleting it is kind of futile.

Squashing Word Files

Q. I was surprised recently to see that a small Microsoft Word file — only a few paragraphs long — occupied 218K of disk space. The file was once large, but then I cut quite a bit out. Could it be that because I have the Allow Fast Saves option turned on in the Preferences dialog box, the data I cut was never purged from the file? It shrank to 10K when I saved with the Save As command.

Now I'm wondering if I

have other unnecessarily large Word files on my disk. Is there any way to automatically search for and perform a Save As on old files?

Robert Erck
Argonne, IL

Bob: You've discovered a phenomenon we've mentioned before in this column — using the Save As command instead of Save can shrink certain files. Files can bloat way beyond the size they should be if a program uses some type of "fast" save routine to reduce the time it ordinarily takes to save a document. PageMaker and Word are two programs that have this ability, and each lets you disable it in the Preferences dialog box.

There is no easy way I know of to automatically search for and perform a Save As on old files that need slimming down. Finding the files is relatively easy: Use any find-file utility, such as No Hands Software's Magnet or FindPro II (available from MacUser's on-line service,

ZiffNet/Mac), and search for Microsoft Word and/or Aldus PageMaker files.

Once you've found all of your Word or PageMaker files, though, it gets more complicated. I don't know of a fast, easy way to open each file, issue a Save As command, and then close each file. You *could* create a script with CE Software's QuicKeys or UserLand Frontier, but it would take some time to get it just right. If you plan to perform this little exercise frequently, it *might* be worth it.

A more efficient technique would be to search for Word or PageMaker files larger than, say, 100K (DiskTop, File Director, and Magnet all let you do this easily) and then manually perform a Save As only on these bigger files (see Figure 2).

In future, remember that there's a trade-off between faster saves and smaller files. If you can remember to issue a Save As command when you've finished working on a file, you get the best of both worlds. If you can't remember, you'll have to decide which is more important to you — faster saves or smaller files.

Andy: You see, it's crass philistinism such as this that has led me to adopt TeachText as my main word processor. No bloated files, *and* you can open and work with files created with older versions (heck, you can work with files created with *newer* versions, a trick those slick-haired college boys and girls at Microsoft have only a toehold on). Best of all, because there's an imposed 32K limit on the amount of text you can slap into a TeachText file, you can close down the office and get into bed with a big mug of Ovaltine much, much earlier than you could with Word, which forces you to keep writing until the job's done, regardless of file size.

Type 1 Behavior

Q. Every time I start working with one of my favorite applications, it quits and I get the message, "The application unknown has unexpectedly quit due to an error of type 1." I have tried starting up with all of my extensions off, but I get the same message (although once or twice, it said that it was a type 2 error rather than type 1). What do these error messages mean?

Harold Smoliar
via the Internet

Andy: Harold, I'm going to confirm what you and thousands of Mac users have suspected ever since those error IDs started cropping up: They're the Mac equivalent of the Magic Eight Ball, the wacky, fluid-filled divination tool. Much as the Magic Eight Ball will tell you, "Situation unclear, try again later" and "All indications point to yes," the Mac occasionally spits out error messages picking a number more or less at random and counting on human nature to wildly interpret its vague message to fit whatever situation is at hand.

The most ubiquitous error codes are, of course, System 6's ID 1 and ID 2, which System 7 users all know and revile as bus errors and address errors, respectively. Address and bus errors are almost entirely the fault of code that doesn't play nice with other software, so the obvious cure is to run the problematic application with all extensions turned off (hold down the Shift key as you boot). By adding extensions and apps one at a time, you'll be able to isolate the software that's causing problems.

Another option is to run a diagnostic program such as Teknosys' Help! or Maxa's Alert!, which contain huge databases of known software conflicts and can analyze your hard disk for apps and extensions that are known enemies.



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Powercache Adapter		\$40
Fast Cache IIsi	\$279	\$349
Fast Cache IIsi		\$199
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POWER TOOLS HELP FOLDER

If errors persist, then it's possible that one of your apps or extensions or even the System file itself is corrupted. When this happens, the only recourse is to remove those apps and reinstall them from your original installation disks. In fact, reinstalling all of your software once every four to six months goes a long, long way toward preventing problems.

Bob: By the way, when you reinstall the offending program, remember to trash its Preferences file if it has one (look in the Preferences folder inside the System Folder). Doing this can work like a charm when you're having problems.

If that doesn't work, reinstall your system software. Before you do, remove any fonts you've installed in the

System file, by dragging them to a new folder. And don't forget to trash your System file and Finder *before* you reinstall the system software; otherwise there's a good chance that the Installer will merely attempt to install some new resources in the *old* System file and Finder, which may still be corrupted.

If that doesn't do the trick, it could be that you recently upgraded your system software and that the program you're having trouble with isn't compatible with the new system software. Either upgrade to a newer version of the program (if one is available), or go back to using the older version of the system software.

Andy: As long as we're still talking about reinstalling software, here's another gem of

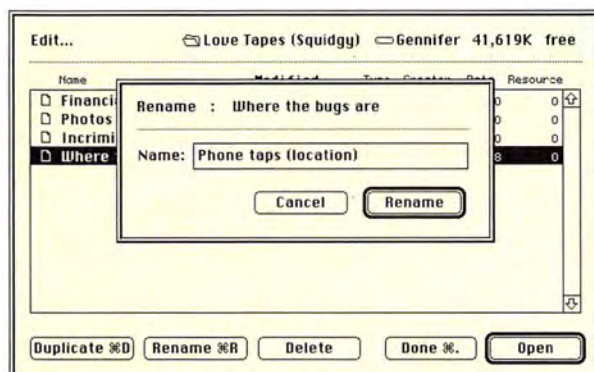


Figure 3: Super Boomerang, part of the Now Utilities package, includes commands that let you delete or rename files from within Open and Save dialog boxes.

advice that is often overlooked — don't ignore your hard disk's software driver. The reason for this is that if it's woefully out-of-date, the software driver can cause a lot of trouble. So if you haven't re-formatted your disk with a

new driver in a couple of years or if you have several volumes, each formatted with different software, it could be helpful to reformat everything with a modern, universal formatter such as Casa Blanca Works' Drive7.

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The Naming Game

Q. Is there any way to change the name of a file while it is open?

Barbara Freedman
Lindenhurst, NY

Bob: I don't know of a program or a technique that lets you change the name of an open file, but that's just as well when you think of all the havoc that might result if it were possible. The next-best solution is to try Super Boomerang, part of the excellent Now Utilities collection, from Now Software. Super Boomerang tames the Open and Save dialog boxes by remembering which files and folders you've used recently, to make it easier for you to find and open files. It also lets you duplicate, rename, or delete files from within the Save or Open dialog boxes (see Figure 3).

There are two ways you can use Super Boomerang to make renaming files easier. One is to save a second version of the file, using a new name, and then use Super Boomerang's Delete option to trash the older file. The second method is to close the file and then use Super Boomerang's Rename option to change the file's name. Either way, you'll save a trip back to the Finder.

Andy: How about renaming the file *before* you open it? Too easy? OK then, here's another strategy: Keep all of your daily work in one folder and view the files by date. You can then change the names of the most-recent files.

Our 32-Bits' Worth

Q. I'm using an LC II with System 7.1 and 4 megabytes of RAM. I turned on 32-bit

addressing in the Memory control panel recently, and now one of my old applications doesn't run. Because I plan to install 10 megabytes of RAM (the LC II's limit) eventually, I'm concerned that I may have problems using all of it. If I can't upgrade a program so that it works with 32-bit addressing on, can I turn 32-bit addressing *off* to run that program? And if I do turn it off, will my Mac think it has only 8 megabytes of RAM, leaving 2 megabytes in the ozone?

Michael Brown
Deer River, MN

Bob: As you have discovered, turning on 32-bit addressing allows you to discover which of your programs are "32-bit dirty" before you install your new RAM. Turn on 32-bit addressing, and test

all the programs you use most to find out which ones need an upgrade.

If you can't upgrade a particular program, you can certainly turn 32-bit addressing off (you'll have to restart your Mac, though). And yes, if you do this with 10 megabytes of RAM installed, your Mac will think it has only 8 megabytes of RAM.

Let me finish by saying that it is generally agreed that you can *never* have too much RAM. Many programs run better if you increase their RAM allocation in the Finder's Get Info box (select the application, and then choose Get Info from the File menu or type Command-I). And you can have more programs open at the same time if you get more RAM. Try it; I can guarantee you'll like it. ☐

Desktop Dynamo

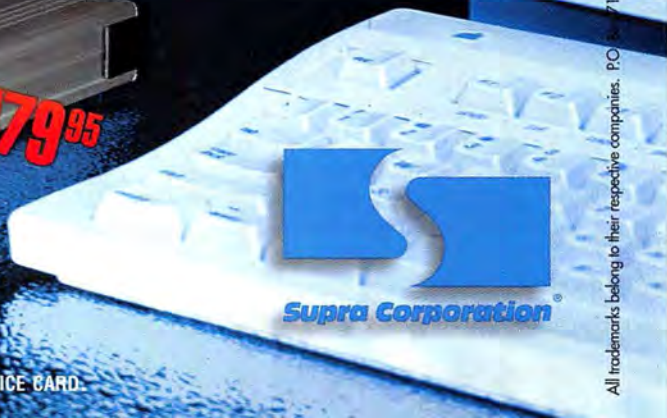
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Shrink Your Files

File compression is a fact of life on-line. Because small files download faster than do large ones (thus saving you money), almost every file you come across on a BBS (bulletin-board system) or on-line service — from the humblest freeware extension to the mightiest commercial software demo — is stored in a compressed form.

The overwhelming majority of compressed files on-line are in one of three formats. Aladdin Systems (408-761-6200) provides two of the formats — the one used by the older StuffIt 1.5.1 and the newer standard used in StuffIt Deluxe 3.0. The third standard is from the Compact Pro shareware utility.

To find out which standard works best, we compressed a variety of files in each format as well as in AppleLink's package format and in ZipIt's Zip format (commonly used by PCs). Although the degree of compression depends on the type of file — from more than 60-percent compression for plain text files and simple spreadsheets to less than 20 percent for complex PICTs and QuickTime movies — the different compression formats were remarkably consistent. AppleLink and StuffIt 1.5.1 offer the least compression, and Compact Pro, ZipIt, and StuffIt Deluxe 3.0 offer the most. The latter three formats shave 10 to 15 percent more from a file's size than AppleLink and StuffIt 1.5.1 do.

But the very best compression was provided by StuffIt

Deluxe 3.0, which cuts a file's size by as much as 5 percent more than do its closest rivals. This consistent edge in compression led ZiffNet/Mac to adopt StuffIt Deluxe 3.0's format as its standard compression format. This format is available in the commercial product, StuffIt Deluxe 3.0, as well as in its shareware version, StuffIt Lite, reviewed on this page.

For more information, check out our test data on-line. Simply download the file CMPDAT.SIT from Library 7 of the Download & Support Forum.

Zmac Reviews



StuffIt Lite 3.0.5

StuffIt Lite (filename SITLITE.SEA, Library 1) is the shareware compression utility of choice. Using the new StuffIt 3.0 format, StuffIt

Lite offers better compression than any other Mac utility. It can create archives in the older 1.5.1 format as well as self-extracting archives (for those who want to send files to people who lack StuffIt). It can also decipher archives created by Compact Pro and AppleLink. At 450K, it's a hefty download, but it offers most of the features of the higher-priced commercial StuffIt Deluxe — lacking only the scripting, bundled drag-and-drop utilities, and some of the translation options of the Deluxe version — for a \$25 fee, \$45 less than Deluxe's street price. Longtime shareware rival Compact Pro, also \$25, is much smaller to download but is not as good.



StuffIt Expander 3.0.1

Aladdin's StuffIt Expander (filename STUFEX.SEA, Library 1) is an ingeniously

designed decompression utility that can decompress StuffIt Lite 1.5.1 and Deluxe 3.0 archives, AppleLink packages, and Compact Pro archives. Expander is omnivorous: It can happily digest self-extracting archives as well as ordinary compressed files, and it can process multiple files, folders, and formats simultaneously. It's also unobtrusive (it supports drag-and-drop under System 7) and adaptable. For no-frills, no-fuss file decompression, Expander is just about perfect. Moreover, it's a modest 92K to download and absolutely free.

Unstuff Your PC

Sending StuffIt files to a colleague with a PC? As a first step toward making StuffIt a cross-platform standard, Aladdin has created UnStuff/PC, a freeware utility that decompresses StuffIt archives on PCs. The new version, 1.1 (now available on-line), can decipher MacBinary-encoded files. Without this capability, the contents of StuffIt archives would be incomprehensible to a PC.

Unfortunately, UnStuff/PC still has a ways to go. Version 1.1 can't handle self-extracting StuffIt archives, and because it's a DOS program, locating and decompressing downloaded archives is a tedious process. Unless you use a shell such as Norton Desktop for Windows (which provides drag-and-drop capability), you'll have to wait until Aladdin gets around to creating a Windows version for UnStuff/PC to become any easier to use.

FREE!

FIND FILES FAST

Sick of the sad little find-file DA that was included with your system software? What you need is FindPro III, this month's *MacUser* utility. Building on the previous version's blinding speed, FindPro III adds many new find criteria and the ability to perform multiple-criteria searches. For example, you can direct the application to find all Excel spreadsheets bigger than 100K; created since February 1, 1993; and containing the word *budget*. In a matter of seconds, FindPro III will scan your hard disk and present you with a list of all the files that meet these conditions. From this list, you can open, show, delete, move, copy, or alias any found file.

FindPro III was programmed by developer Bill Monk, of Birmingham, Alabama (reach him on ZiffNet/Mac at 72511,301). The utility is available exclusively on ZiffNet/Mac, and under the membership fee, it's available free for one month. Just type GO ZMC:POWERTOOLS until June 25, 1993; after that, find the file FINDPR.SIT in Library 3 of the MacUser Forum (GO ZMC:MACUSER).

By Mark Simmons

Direct Line

MAIL ORDER SECTION



For many of you, mail-order is your primary means of purchasing Macintosh products and services. That's why MacUser has put together the following special section. Direct Line offers a convenient place to quickly find the products you need from the vendors you want to buy from. But before you shop by phone, look for the mail-order company that is best for you. Here are a few tips to help you get the most out of your buying experience.

How to Buy Mail Order Products

Research The Company

Well-established companies tend to be reliable, but if you're not sure how well established a company is, it pays to do a little research and ask a few questions.

Know What You Want

Know exactly what you want before you call. Magazines, on-line forums, and user groups are all good places to seek advice.

Check Compatibility

To avoid having to return merchandise, find out whether the product you're interested in is compatible with your system.

Pay With Credit

Whenever possible, use a credit card. Some credit-card companies do such

things as double your warranty or give you a refund if you find a lower price elsewhere. If you have a problem, your credit-card company will deal with the mail-order company.

Confirm Prices

Confirm the price when you place your order, including delivery charges. Some companies will waive the delivery charge.

Delivery Methods

Ask about delivery methods — find out what carriers are used, how fast they are, and how much each one costs. Record delivery information.

Return Policies

Because you're buying sight unseen, make sure the company has a return policy you're comfortable

with. Find out if you're responsible for paying shipping charges on returned goods and whether you'll be charged a restocking fee.

Check Packing Slips

Before you use your new merchandise, make sure it's exactly what you ordered — the correct model or version number, for example. It's easier to return goods before they've been unpacked.

Repair/Replacement Services

If you're buying hardware, find out how the company handles repairs or replacements.

Technical Support

Technical support varies from company to company. Make sure you know what help is available.

Connect Your Mac To Your TV Or VCR!

Why limit your ideas to the confines of a computer screen? The amazing Mac DisplayLink converts RGB (from your Mac's display) to NTSC (television standard) supporting composite and high resolution S-video. Your presentations, demonstrations, video games, animations, graphics, Photo CD images and QuickTime movies will look crisp and vivid on TV, recorded to VCR or displayed through a video projector.

The Mac DisplayLink is the low cost way to achieve big-screen impact! Training, marketing, sales and point-of-purchase materials jump to life! Video communications become much more powerful. The Mac DisplayLink reproduces all the colors generated by your Mac, from grayscale to "millions of colors." Easy to install and a snap to use.

The self-contained housing holds computer/video cables and AC adapter. Includes everything you need to get the show on the road fast. Supports 8•24, 8•24GC, the on-board video of the Quadra and Centris line or any NuBus machine with appropriate video card. A handy computer/video switch enables you to easily switch between computer display and video output without changing cable connections.

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Four additional ADB ports and the connection for an optional ADB power supply are conveniently located here.

One of the most useful new ideas in computing. Enables you to control—from a sleek software interface—up to six serial devices (Macs only come with 2, printer and modem). It's like having two computers! Configure your equipment any way you like: one Mac to six devices; one Mac to five networks or four Macs to two devices. A snap to install, simple to operate and fully System 7 compatible. Fully guaranteed for two years.

So forget changing cables, swimming through wires and fiddling with A-B switches! With MultiPort, you simply pop up the Desk Accessory screen, select the port you want to use from a graphical screen dia-

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ZERO FOOTPRINT DRIVES



There's a Spin Zero Footprint drive for every application. They include everything you need to get up and running. Check this chart for specs and prices.

Capacity (MB)	Model Number	Average Access Time (msec)	Transfer rate (K/sec)	MTBF (Hours)	MFG warranty (months)	Internal Drive Price	Zero Footprint Drive Price	Compact Drive Price
Conner								
85	CP-30080E	16	1300	150000	24	\$199	\$259	
120	CP-30100	16	1300	150000	24	\$259	\$309	
170	CP-30170E	16	1400	150000	24	\$269	\$329	
213	CP-30200	15	2000	150000	24	\$349	\$399	
Quantum								
85	ELS 85S	17	1800	250000	24	\$199	\$269	
127	ELS 127S	17	1800	250000	24	\$229	\$299	
170	ELS 170S	17	2000	250000	24	\$259	\$329	
240	LPS 240S	16	2300	250000	24	\$329	\$399	
80 (Pwrbk)	GO 120	17	1900	150000	12	\$349		
Digital Equipment								
1.05GB	DSP-3105	9.5	2600	250000	60	\$1,249	\$1,299	\$1,349
Seagate								
240 (PowerBook)	ST-9295N	16	2100	150000	12	\$549		
1.05GB	ST-11200N	10.5	3200	200000	60	\$999	\$1,049	\$1,099
Fujitsu								
520MB	M2624FA	9	2700	200000	60	\$799	\$859	\$899
1.06GB	M2694FA	9	2800	200000	60	\$1,399	\$1,449	\$1,499

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66-1200

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In the May issue of Macworld magazine, Mirror's PixelView Full-page Display was singled out as Editors' Choice. We'd like to thank Macworld for this acknowledgment of our hard work.

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Equally important is the feedback we get from our customers. A recent independent survey of monochrome monitor owners ranked Mirror #1 in customer loyalty (beating out Radius, SuperMac and RasterOps).



"Our panel of editors judged the Mirror monitor to be the best, with sharp focus over the entire screen...an excellent value."
Macworld,
May 1993
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It's one thing to design a product every bit as good as Radius and SuperMac (who

we think set the standards for great displays). But delivering them without dealer mark-up at savings of up to 40% makes them unquestionably the best value on the market.

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Thousands of satisfied customers have discovered our 19" PixelView Two display. With our risk-free satisfaction guarantee, you can too.

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The PixelView Two-Page Display lets you view 12 months of your budget or both pages of your newsletter layout. It features 72 dpi resolution—a must for desktop publishers.

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Our exclusive Desktop Designer software allows you to use the built-in screen on a Classic, SE, or SE/30 as an extension of the large screen, giving you even more workspace. And adds productivity enhancements like pop-up menus, enlarged cursor and a screen saver.



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Bernoulli MacTransportable MultiDisk 150



Enjoy all the benefits of a Bernoulli with the flexibility to read and write to disks of many capacities - 35MB, 65MB, 105MB, and 150MB. And the MultiDisk 150 is downward compatible so it reads and writes to 90MB disks and reads 44MB disks. You get unlimited storage expandability, lock-away security, and transportability. The patented Bernoulli design resists head crashes and the sturdy disks can survive a drop of eight feet! This Bernoulli is internally terminated with a single external SCSI connector, so it must be installed as the last device on your SCSI chain. Get lots of storage while you're at it with a cartridge tri-pak and save up to \$26. (#5609, IOMEGA)

Minimum requirements: Mac Plus, System 6.0.

\$398. 150MB Cartridge Tri-Pak (#5707, limit 3) Save \$26.

\$398. 90MB Cartridge Tri-Pak (#3503, limit 3) Save \$20.

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Minimum requirements: SE 30, 2.5MB RAM, System 6.0.5.

\$96.



Aldus IntelliDraw Competitive Upgrade

Move to IntelliDraw from any other drawing software. It's so unique it actually does much of the drawing for you. Professional-looking flow charts, maps, and more are all a snap with IntelliDraw. Create symmetrical graphics instantly with the exclusive Symmetricon feature. Diagrams are effortless with "sticky" connector lines. Change one "master" object and all linked objects are altered. (#6191, Aldus)

Minimum requirements: Mac Plus, 2MB RAM, System 6.0.5, 4MB RAM under System 7.

\$288.



SupraFAXModem V.32bis Mac Pac

Get a top-of-the-line fax/data modem at an amazingly affordable price! The SupraFAXModem V.32bis features 14,400 bps communications with up to 57,600 bps throughput with another modem that supports both V.32bis and V.42bis data compression. And it maintains downward compatibility with the millions of V.32, 2400, 1200 bps modems already in use. (#4017, Supra)

Minimum requirements: Mac Plus.

\$32. each



MacAcademy Videos

Learn programs the easy way. Videos let you see each technique on the Mac screen. MacAcademy videos have no blurry screens, no paid actors reading scripts, and no frills. Each features one of their top trainers recreating the classroom atmosphere. Macworld readers chose MacAcademy as the top trainer in the nation in 1992. (MacAcademy)

\$32. System 7.1 Tape #1 (#6254)

\$32. PowerBook #1 - In The Office (#5826)

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1MB 80ns SIMM

If you're moving up to System 7, need faster task processing, or want several applications open at once, you may need more memory. Mac's Place makes upgrading your Mac's memory easy with our lifetime warranted SIMMs. And they're easy to install with the included illustrated guidebook and FREE SIMM Remover. It's made of anti-static plastic and removes SIMMs safely from desktop Macs and PCs. Don't know how many SIMMs you need? Call and talk to one of our Mac consultants. Just let us know what kind of applications you're running, and we'll make sure you get what you need - a faster more productive Mac. (#3179, Mac's Place)

\$9. or FREE with SIMMs, SIMM Remover (#5319, Stratos)

\$100 rebate

NEC 24-bit Accurate Color



Advanced display technology and superior screen performance are more affordable than ever. With larger screens, high refresh rates, and support for multiple resolutions including the 1024 x 768 resolution of the Centris 610 and 650 and Quadra 800 and 950, MultiSync monitors give you bright, clear images and flexibility. The 4FGe shown provides the productivity advantages of a larger 15" screen with digital controls and support for many resolutions. It also includes the AccuColor control system, making it ideal for color-intensive 16- or 24-bit applications. (#6262)

The MacFG 24Xp Color Interface Card maximizes the display performance of FGe series monitors with 24-bit color. (#5918, NEC)

\$699. MultiSync 4FGe

\$498. MacFG 24Xp Display Interface nabus slot

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Minimum requirements: Any Mac running System 7, 2MB RAM.



\$149.

AppleTalk Remote Access

Communicate with another Mac or AppleTalk network over standard telephone lines with AppleTalk Remote Access. It gives you direct and convenient access to information and resources at a remote location. Get files from your office and bring them up at home, check your e-mail, print to a remote printer - all with AppleTalk Remote Access. (#4610, Apple Computer)

Minimum requirements: Mac Plus, 2MB RAM, System 7.0.

\$958.

AppleShare Server 3.0

This powerful file server allows shared file storage for up to 120 users and queued access to five network printers. This version improves security with minimum password length, adjustable time limits for temporary accounts, and more. Share CD-ROMs or removable hard disks, too. The AppleShare Server supports multiple operating environments allowing access to Mac, Apple II, and MS-DOS computers. (#4611, Apple Computer)

Minimum requirements: a dedicated Mac Plus, 4MB of RAM, System 7.0.

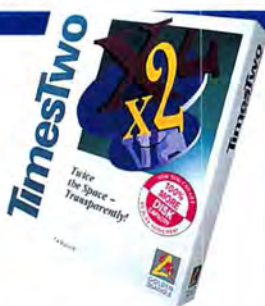
\$89.

Times Two

Is your hard disk bursting at the seams? Get TimesTwo! An easy, one-time installation expands your disk capacity as much as 100 percent in minutes. Unlike file compression products, TimesTwo works by transparently compressing disk blocks, not files. So when you move a file from your TimesTwo hard disk to another device or across a network, it arrives in its original form. TimesTwo is compatible with all Mac software, including file recovery programs, and works with all SCSI disks. See for yourself why TimesTwo was a 1992 MacUser Editor's Choice finalist! (#5233, #5600, Golden Triangle)

Minimum requirements: Mac Plus, 2MB RAM, System 6.0.4.

Get a SyQuest Cartridge for only \$60 with the purchase of TimesTwo. (#2269, limit 5)



\$118.



Simply Accounting

Simply Accounting contains everything you need to get up and running in a flash. The primer walks you through basic accounting principles, and includes a real-life tutorial with sample data. Yet it has all the practical, powerful features you need to grow a successful business. Reports, General Ledger, Accounts Receivable/Payable, payroll, and much more. (1366, Computer Associates)

Minimum requirements: Mac Plus, 1MB RAM, System 6.0.

\$148.*

The Microsoft Office Made Easy

Get a \$20 rebate from Personal Training Systems! If you're looking for the easiest way to master software, you've come to the right product. This package includes three tutorials covering the basics of Excel, Word, and PowerPoint. Each tutorial contains a practice disk, quick reference card, extra practice card, and audio cassette. (#6251, Personal Training Systems)

Minimum requirements: Mac Plus, 2MB RAM, System 6.0.2, a cassette player, 4MB RAM under System 7.

*Price after \$20 rebate.

\$328.

DataPlace + 85MB Drive

The longer you own your Mac, the more you'll find yourself wanting more hard drive space. All DP+ drives feature a sturdy case, two metal-clad SCSI connectors, external fuse, easily accessible SCSI ID switch, manuals, cables, a two-year warranty, and instant technical support from Mac's Place. Plus you get MacTools 2.0, DP Formatter Plus, SpaceSaver, and Kaboom! SE, **FREE**. (#5278, DataPlace)

\$998. DP+ 240MB (#4195)

\$145. each

Retrospect 2.0 Retrospect Remote 2.0

Retrospect provides powerful backup and storage management. If your hard disk crashes, Retrospect can restore it to its pre-disaster state and get you back up to speed in minutes. (#6048) Retrospect Remote is centralized backup and archive software for Macintosh networks. Complete automation allows for daily, unattended backup of ten Macs to a single storage device. (#6050, Dantz Development)

Minimum requirements: Mac Plus, 2MB RAM, System 6.0.5, a hard disk, 4MB RAM under System 7.



\$748.

Infinity 105

The Infinity 105 is the smallest and fastest removable SyQuest drive available. It provides sustained data transfer rates of up to 1.75MB/sec. and access time of 14 ms. It allows you unlimited storage capabilities by simply adding additional 105MB 3.5" cartridges. The Infinity 105 is an ideal storage device for animators, on-line editors, and users of interactive multimedia who need to take their shows on the road. It's about the size of a paperback novel so it's a perfect portable storage solution. And it can also be daisy-chained to other devices for desktop use with an external power supply. (#6255, PLI)

\$99. SyQuest 105MB 3.5" Cartridge (#6256)



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WordPerfect for Macintosh 2.1.3

You can paste QuickTime movies into your documents and share data via Publish and Subscribe through this full-featured favorite. And it handles graphics, too. Edit, size, scale, and crop graphic images with ease. The tool palette and drawing commands let you create and edit graphics in WordPerfect! You also get Grammatik 5 **FREE**. It checks spelling, grammar, and punctuation against 58 rules. (# 4111)

LetterPerfect is a streamlined version of WordPerfect that requires less memory and disk space. It's perfect for Classic, LC, and SE owners needing formatting, page layout, and word processing tools. Create columns, format with the Ruler, and add graphics. (WordPerfect)

Minimum requirements: Mac Plus, System 6.0.3, 1MB RAM for WordPerfect, System 6.0.5 for LetterPerfect.

\$84.** LetterPerfect (#5692)

*Price after \$20 rebate. **Price after \$10 rebate.
System 7 purchase required.



\$583.*

Aldus PageMaker 5.0

The long-awaited 5.0 is here! A few of the new 5.0 features: incremental rotation of text and graphics, built-in color separation, multiple open publications, and interruptible screen redraws. If 5.0 isn't released when you call, order 4.2 to get in on the rebate with your System 7 Upgrade purchase. Then you'll get an upgrade to 5.0 **FREE** from Aldus as soon as it's available. (#6287, Aldus)

\$479* Aldus PageMaker 4.2 (#4024)

Minimum requirements: LC or Classic, 4MB RAM, System 6.0.7, a 20MB hard drive.

*Price after \$15 rebate.
System 7 purchase required.



\$49.*

S.A.M. 3.5

S.A.M. is the only program that scans automatically at prescheduled times. It scans files, folders, and volumes for known and unknown viruses, repairing infections caused by known viruses. S.A.M. even scans compressed files, no matter what type of compression software is used. And it now has a color interface that makes it even easier to use. (#5591, Symantec)

Minimum requirements: Mac Plus, 1MB RAM, System 6.0.7, 2MB of RAM under System 7.

*Price after \$15 rebate.
System 7 purchase required.



\$51.*

Apple Font Pack

When you've finally found the right words, make sure you've got the right font. This is a carefully chosen selection of 43 TrueType fonts. They're expertly crafted to provide excellent results - maximum legibility on screen and crisp output on paper. The Apple Font Pack includes new display, text, and symbol faces to give you a wide range of type choices. (#5248, Apple Computer)

Minimum requirements: Mac Plus, System 7.0, a hard disk.

*Price after \$15 rebate.
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Minimum requirements: SE/30, 2MB of RAM, a hard disk.

*Rebate offer expires June 30, 1993.



\$43.*

Macintosh PC Exchange

Now you can conveniently work with PC files from 3.5 or 5.25 DOS and Windows disks on your Mac. Just insert the disk into your Apple SuperDrive or compatible floppy disk drive. Subdirectories on the disk appear as folders, and data files as documents. You can open, change, and save DOS documents just like they were Mac files. (#4609, Apple Computer)

Minimum requirements: SE/30, 3MB RAM, System 7.0, a hard drive.

*Price after \$15 rebate.
System 7 purchase required.



\$43.*

FileRunner

"FileRunner may be the best file synchronizer around. Its interface for selecting files is clear and simple," says *MacUser*. (May, 1993) And FileRunner is the only file synchronization software that synchronizes file deletions. It also identifies and transfers updated and new files to all your Macs, not just two. FileRunner protects data with its exclusive Overwrite Safeguard if the same file has been changed on more than one Mac. Use FileRunner on floppies, removable hard drives, cartridges, AppleShare servers, or remote disks with AppleTalk Remote Access. It also includes Virex virus detection software. Get FileRunner **FREE** with Field Assistant. Look for Field Assistant in this ad. (#6168, MBS Technologies)

Minimum requirements: Mac Plus, 1MB RAM, System 6.0, a hard drive, 2MB RAM under System 7.

*Price after \$15 rebate. System 7 purchase required.



\$274.* each

Microsoft Excel 4.0 or Word 5.1

The number-one selling spreadsheet for the Mac now makes spreadsheet tasks easier than ever before. With Excel 4.0 you can produce a spreadsheet fast using features like drag-and-drop to move information or autofill to intelligently project trends. Create multiple "what if" scenarios and use the Scenario Manager to view them all at the same time. (#4356)

Word 5.1 gives you a unique customizable Toolbar. So you just click buttons to do common tasks in one step - like checking spelling and adding bullets. You can even change the buttons to best suit the tasks you do most. And with drag-and-drop editing and the built-in grammar checker, you'll polish up documents in no time. (#5567, Microsoft)

Minimum requirements: Excel - Mac Plus, 2MB RAM, System 6.0.5. Word - Mac Plus, 1MB RAM, System 6.0.2, 4MB RAM and a hard drive under System 7.

*Price after \$20 rebate. System 7 purchase required.



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(#6278, Graphic Simulations Corp.)

Minimum requirements: SE/30, 3MB RAM, System 6.0, Quickdraw capability.



\$62.

So You Want To Be A Rock And Roll Star

Ever want to be a rock and roll star? Here's your chance. So You Want To Be A Rock And Roll Star teaches you to play guitar and keyboard. You even get your own professional backup band. You can play or just sing along karaoke-style. Songs include "Dock of the Bay," "Stand By Me," and four more.

(#5744, Interactive Records)

Minimum requirements: LC, 4MB RAM, System 6.0.4, CD-ROM drive, 256 RGB monitor.

\$548.

Board Copy

The new Casio Board Copy lets you make instant black-and-white copies that you can fax or file. Snap a shot of your meeting's white board for instant hand-outs or to document the process. You can even shoot three-dimensional objects. Send a copy of a fully-constructed store display into the field with the display's parts as an example. An auto-focus system means you just point and shoot to produce clear copies of just about anything. Board copy provides resolution equivalent to 3.9 million dots - the same as a fax. Three modes let you specify white board, black board, or graphics.

(#6268, Casio)



\$98.

Notebook KeyPad with Software

Get full keyboard performance with the Kensington Notebook Keypad. Compact and lightweight, its calculator-style layout makes data entry easier. Reduce keystrokes using 15 function keys. Adding Machine Software lets you perform repetitive functions quickly and efficiently. Choose between the adding machine and calculator windows and get the advantages of both.

(#5958, Kensington)

Minimum requirements: Mac SE, System 6.0.4.



\$298.

Bose RoomMate Speakers

Get a FREE membership to the Bose Express Music Catalog, a limited edition sampler disk, and \$50 in coupons toward CDs when you buy Bose speakers from Mac's Place! The Bose RoomMate Computer Monitor provides room-filling sound for your computer system - perfect for desktop multimedia use or listening to CDs.

(#6197)

The Powered Acoustimass-3 Series II speaker system has two tiny cube speakers and a bass module for the rich lifelike sound you'll want for multimedia presentations.

(#6198)

Bose offers advanced performance. Distortion-limiting circuitry ensures lifelike sound. Active equalization delivers full rich bass, balanced midrange, and crisp clear highs. And magnetic shielding prevents interference with your video monitor and storage media.

(Bose Corporation)



\$699.

Powered Acoustimass-3 Series II Speakers

\$58.

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(#6243, Bureau Development, Inc.)

Minimum requirements: Mac Plus, 1MB RAM, a CD-ROM drive.



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- When a partial order is shipped, we pay freight on additional shipments.
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- Call 206-883-8312 for our international sales line.
- We ship throughout the free world via Airborne Express International.
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\$132.

PowerBook Battery and Charger

The PowerBook Battery runs 25 percent longer between charges than the original 140/170 PowerBook battery. And it's built better. A hard plastic cover keeps the plates from getting dirty and any poor contacts from short circuiting. The PowerCharger charges quickly and keeps your batteries from losing capacity like they can if they're not exercised over their full charge range.

(#5726, BTI)

Works with PowerBook 140, 145, 160, 170, and 180 models.



\$75.

Daymaker 2.0

Daymaker 2.0 is not only dramatically faster than before, it's filled with new features. The most requested is the "recurring events" function. Now you can name special events and have them automatically inserted into your calendar at regular intervals of your choice. And all your DayMaker printouts can now show headers, footers, page numbers, plus date and time info.

(#5261, Pastel Development)

Minimum requirements: Mac Plus, 1MB RAM, System 6.0.4, a hard disk.



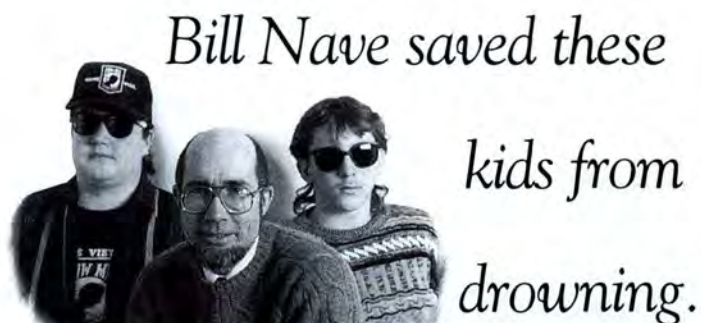
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4MB	M4664LLA \$169
6MB	PN N/A \$239
8MB	PN N/A \$319
10MB	PN N/A \$399
PowerBook 165c	
4MB	PN N/A \$189
6MB	PN N/A \$239
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2.4gig	5.25"	11.5ms	2339	2439

Seagate

One/Five Year Warranty

Capacity	Size	Access	Internal	External
283mb	3.5"	16ms	374	434
600mb	3.5"	10.5ms	949	999
1.2gig	3.5"	9ms	1299	1359
2.4gig	5.25"	11ms	2499	2599
3.4gig	5.25"	10ms	3399	3499

Toshiba

Two Year Warranty

Capacity	Size	Access	Internal	External
213mb	2.5"	12ms	599	699
877mb	3.5"	12.5ms	1039	1099
1.2gig	3.5"	12ms	1349	1409

Hitachi

Five Year Warranty

Capacity	Size	Access	Internal	External
1.2gig	3.5"	11.8ms	1229	1289
1.6gig	3.5"	11.8ms	1659	1759
3.7gig	5.25"	12.8ms	3299	3399



Tape Backup Systems

Backups include Tape

Capacity	Model	Media	Int	Ext
250mb	Archive Viper	DL6250	459	499
500mb	Archive Viper	DL6250	659	699
1.3 - 2gig	Archive 4320	4mm	1109	1149
1.3 - 8gig	ArchiveTurbo	4mm	1309	1359
1.3 - 4gig	Exabyte 4200	4mm	1459	
1.3 - 5gig	Exabyte 8205	8mm	1759	
1.3 - 10gig	Exabyte 8505	8mm	2609	

Optical Drives

One Year Warranty

All Drives include one Cartridge

Capacity	Model	Access	Ext
128mb	Ricoh	30ms	999
128mb	Fujitsu	30ms	1049
600mb	Ricoh Hyperspace	28ms	1999
1.0gig	Panasonic	90ms	3039

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Panasonic RS307U	600dpi One pass Scanner. Flatbed 256 shades of gray. 8.5" x 14"	930

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60m Tape	16	128mb Optical	35
90m Tape	18	600mb Optical	165
112m Tape	18	250mb Viper	35

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MAC TOWN[®]

Two Year Warranty! **Quantum**

Two Year Warranty! **SyQuest**

	Internal	External
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MacTown 44 MB	\$ 345	\$ 369
MacTown 88 MB	\$ 429	\$ 449
44MB Cartridges 1+ \$ 64/10+ \$ 62/100+ \$ 60		
88MB Cartridges 1+ \$ 97/10+ \$ 96/100+ \$ 93		

All SyQuest drives feature 20MS average seek time, and 60,000 MTBF. Kits include one cartridge, external SCSI cable and formatting utility. All MacTown removeables and cartridges carry a one year warranty. Internal kits compatible with Mac IIvx, Centris 650 and Quadra 900/950 models only.

Capacity	Description	Internal	External
42MB	ELS42/19MS	\$ 175	\$ 233
85MB	ELS85/17MS	\$ 196	\$ 259
127MB	ELS127/17MS	\$ 235	\$ 299
170MB	ELS170/17MS	\$ 303	\$ 365
240MB	LPS240/10MS	\$ 429	\$ 489
525MB	LPS525/10MS	\$ 923	\$ 993

Quantum drives feature 100,000-200,000 hrs MTBF and a two year warranty.

Seagate

Capacity	Description	Internal	External
248MB	ST3283N/12MS	\$ 359	\$ 425
525MB	ST3600N/10MS	\$ 865	\$ 949
1050MB	ST11200N/10MS	\$1099	\$1169
1352MB	ST41600N/12MS	\$1749	\$1925
2100MB	ST42400N/11MS	\$2399	\$2549
2750MB	ST43400N/11MS	\$2999	\$3199

Seagate drives feature one to five year warranty. Internal kits are compatible with Mac II, IIfx, Quadra 900/950 models only.

Two Year Warranty! **Maxtor[®]**

Capacity	Description	Internal	External
120MB	MC7120/15MS	\$ 219	\$ 279
213MB	MC7213/15MS	\$ 289	\$ 369
340MB	LXT340/13MS	\$ 579	\$ 639
540MB	MXT540/8.5MS	\$ 899	\$ 969
1240MB	MXT1240S/8.5MS	\$1429	\$1499

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External SyQuest Dual 44/88mb (*One 44 & One 88 Cartridge)	\$875
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External SyQuest Dual 44/88C mb (*One 44 & One 88 Cartridge)	\$965
SyQuest 44mb Cartridge/10 Pack	\$62.50/\$610
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ELS 85mb	17ms	3.5"TH	\$195	\$255
ELS 127mb	17ms	3.5"TH	\$229	\$289
ELS 170mb	17ms	3.5"TH	\$259	\$319
LPS 240mb	10ms	3.5"TH	\$339	\$399
LPS 525mb	10ms	3.5"TH	\$869	\$929
Pro 700mb	10ms	3.5"TH	\$1139	\$1199
Pro 1.05gb	10ms	3.5"TH	\$1269	\$1329
Pro 1.22gb	10ms	3.5"TH	\$1399	\$1459
*GRS-80mb	16ms	2.5"PB	\$289	\$389
*GO-120mb	16ms	2.5"PB	\$339	\$439

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160mb	13ms	3.5"TH	\$255	\$315
206mb	12ms	3.5"TH	\$339	\$399
515mb	10ms	3.5"TH	\$859	\$919

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Formatted Capacity	Speed	Size	Internal	External
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213mb NEW!	12ms	2.5"PB	\$545	\$645

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1.03gb	15ms	5.25"FH	\$1245	\$1345
1.65gb	15ms	5.25"FH	\$2245	\$2345
2.05gb	12ms	5.25"FH	\$2445	\$2545

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Maxtor

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203mb	15ms	3.5"TH	\$299	\$359
325mb	15ms	3.5"TH	\$569	\$629
520mb	9ms	3.5"HH	\$899	\$959
1.15gb	9ms	3.5"HH	\$1439	\$1499
1.0gb	13ms	5.25"FH	\$1199	\$1299
1.43gb	13ms	5.25"FH	\$1449	\$1549

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MAGNETO OPTICAL DRIVES

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128mb cartridges (Tosoh)			\$39

IRIGOH

Model	Speed	Size	External
128mb	45ms	3.5"HH	\$1039
650mb	28ms	5.25"FH	\$2299
128mb/650mb Cartridge			\$39/\$99

Maxtor

Model	Speed	Size	External
Tahiti IIM	35ms	1.0gb	\$3175
1.0gb Optical Glass Cartridge			\$225

All MO Drives Come With FWB HDT Software, ONE MO Cartridge and have a ONE year Warranty.

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Model	External
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4.0gb - 8.0gb Compression Turbo	\$1399
90m/60m Tape	\$19/\$16

TEAC

Model	External
150mb Tape Backup Drive	\$469
600mb Tape Backup Drive	\$669
600mb / 150mb Tape Cassette	\$25/\$20

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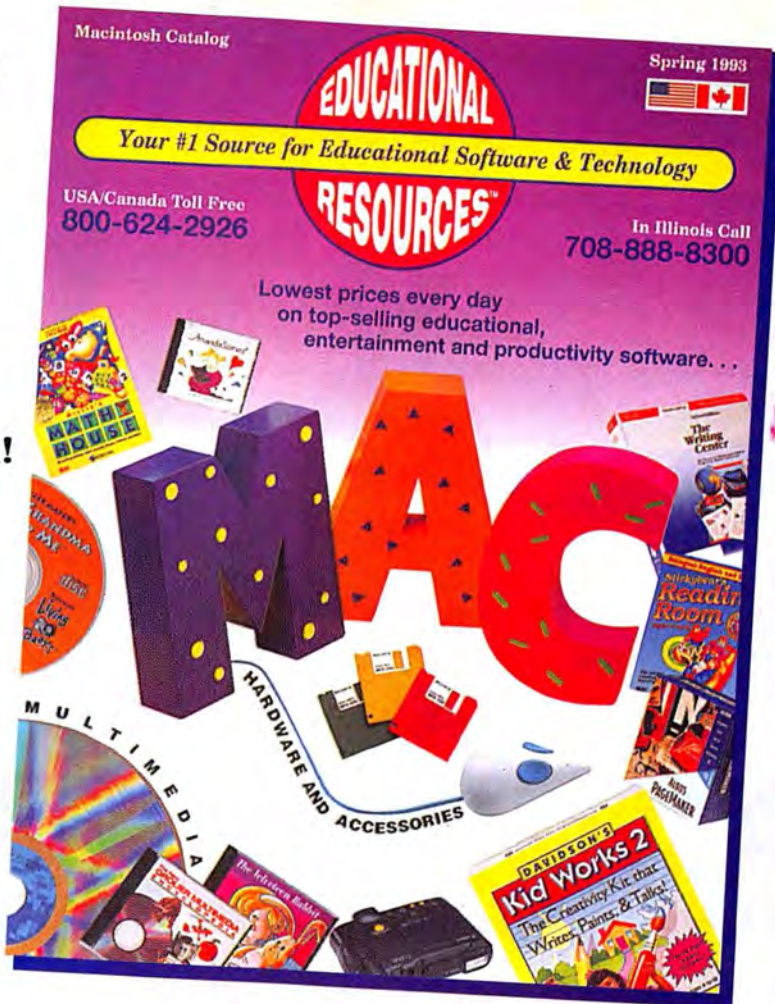
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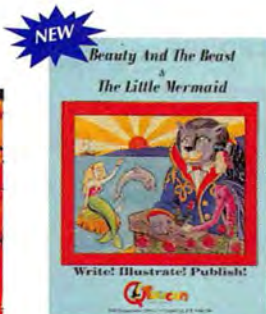
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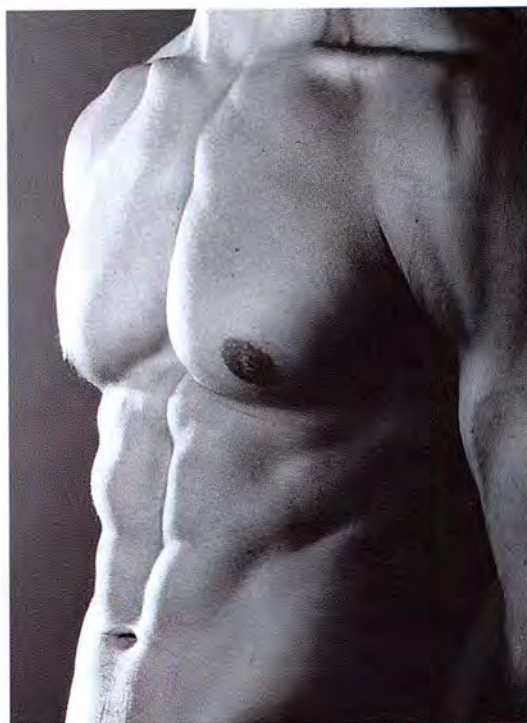
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CMO-OMD5010	Epson	128mb	3.5" Half Height	45ms	\$939	\$969
CMO-JY750	Sharp*	594/652mb	5.25" Half Height	40ms	\$2119	\$2149
CMO-5031E	Ricoh	594/652mb	5.25" Full Height	28ms		\$2345
CMO-Tahiti II	MaxOptix	650/1.0GIG	5.25" Full Height	35ms		\$3149
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Unformatted Capacity	Model	Average Access	Actual MAC Capacity	Internal	External
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213mb	7213S	15ms	202mb	\$299	\$359
540mb*	MXT-540	8.5ms	521mb	\$899	\$959

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1240mb*	MXT-1240	8.5ms	1150mb	\$1449	\$1509

PANTHER SERIES (5.25" Full Height)

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1.7GIG	PO-17S	13ms	1433mb	\$1449	\$1549

Maxtor Drives carry a TWO Year Warranty



Unformatted Capacity	Model	Description		Average Access	Actual MAC Capacity	Internal	External
1.6GiG	ST41651N	5.25" Full Ht	Wren-8	15ms	1350mb	\$1349	\$1449
2.1GiG	ST42100N	5.25" Full Ht	Wren-9	12.9ms	1900mb	\$1725	\$1825
1.6GiG	ST41600N	5.25" Full Ht	Elite-1	11.5ms	1307mb	\$1825	\$1925
2.4GiG	ST42400N	5.25" Full Ht	Elite-2	11ms	2050mb	\$2449	\$2549
3.4GiG	ST43400N	5.25" Full Ht	Elite-3	11ms	2750mb	\$3149	\$3249

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2.0GiG	Archive Python	DAT, DDS	4mm	\$1049	\$1069
3-5GiG	Archive Turbo DAT	DAT, DDS-DC	4mm	\$1329	\$1349
2.0GiG	HP 35470A	DAT, DDS	4mm	\$1269	\$1289
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40 MHZ POWERCACHE*	\$545 / \$635
50 MHZ POWERCACHE*	\$715 / \$845
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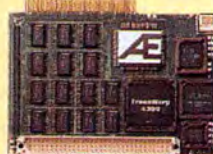
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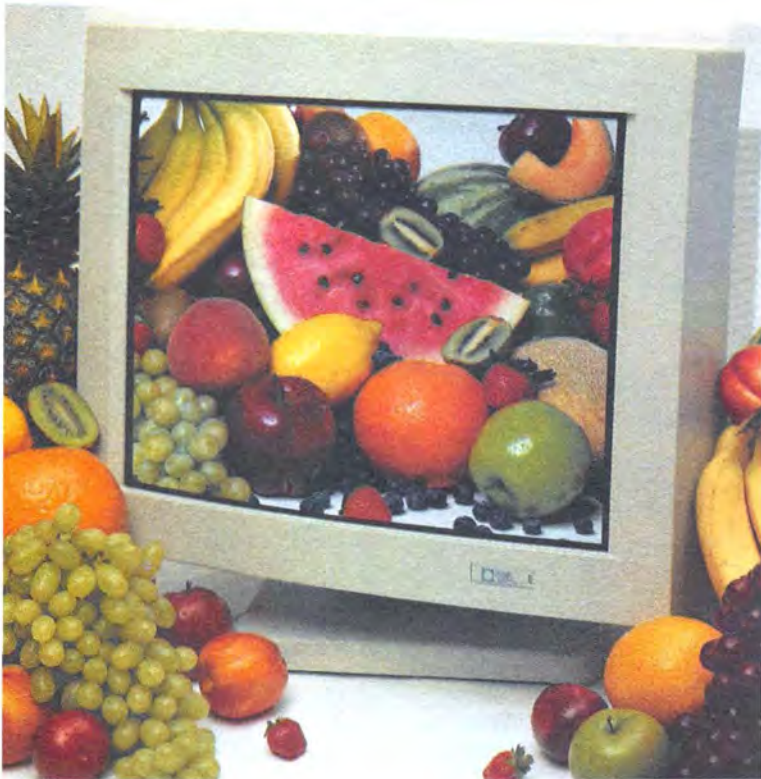
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- 7 programmable settings
- 1024 x 768 standard resolution
- Trinitron® tube from Sony



Real
Tech™

\$1,895

Lease: \$52/mo.

1024 x 768 standard resolution; will auto-sync to 640 x 480, 832 x 624, 1024 x 768, and 1152 x 870.

Multi-level bit depth support provides accurate screen display for all applications.

Will interface with Quadras, and with popular video cards.

“ In the graphic design business, the desktop publishing hardware is changing so rapidly that it can be confusing what to buy — Jon’s knowledgeable and friendly help guided me toward the right decision for my company. ”

— Elaine Kropveld
EKlectic Images

Real Tech 17" Multi-Mode Color Monitor



Real
Tech™

\$995

Lease: \$27/mo.

- Multi-mode
- Auto-syncs to 1024 x 768
- 832 x 624 standard resolution
- Quadra-ready



TOLL-FREE TECH SUPPORT

Have your customer number ready.

Call 1-800-364-MACS.



\$1029

Lease: \$28/mo.



\$489

Lease: \$14/mo.

Wacom Cordless Digitizing Tablets

Precise, real-time control over graphic input...brings back the delight of freehand drawing!

Cordless, pressure sensitive stylus translates your penstrokes into line width, spray density, color changes, and other programmable effects. Paint, draw, trace, and point as naturally as if you were writing.

The standard tablet has a plain surface. The electrostatic tablet is ideal for video graphics, photo retouching, and print pre-press work.

Wacom ArtZ Graphics Tablet
6" x 8" High Speed ADB .. **\$319**

Wacom (SD Series)

6" x 9" Standard	\$489
12" x 12" Standard	689
12" x 12" Electrostatic	759
12" x 18" Standard	1029
12" x 18" Electrostatic	1099

You can always count on our tech team. We receive dozens of customer letters praising their helpfulness and friendly attitude. They're always ready to help when you have a problem.

Seated, left to right: Paul and Craig. Standing: Chris, Tom, Dan, Mike, and Dave.



CUSTOMER SERVICE

When you order from us, you get computer experts, not clerks!

All of our salespeople are trained in Apple's intensive program, as well as our own. On average, they have at least three years of Mac experience. They're ready to help you (with a smile!) both before and after the sale.

TECH SUPPORT

Our tech team is well trained, well informed, and well known for their ability to solve customers' problems with a minimum of inconvenience to the customer. We have the best tech support in the business. And it's toll-free: 1-800-364-MACS. Please have your customer number ready.

FINANCING OPTIONS

We've made it easier than ever to own our productivity-enhancing products.

- VISA and MasterCard
- corporate P.O. accounts (call for information)
- business leasing available

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GUARANTEE

Our famous guarantee: If you don't like it, we'll buy it back. If you're not 100% satisfied, call for your RMA number and return the product within 30 days of the ship date. We'll refund your purchase price (minus consumables for printers).

All prices are subject to change without notice. ©1991

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- 1 **True Lease**...with 10% buy-out option
- 2 **Installment Lease**...with \$1.00 buy-out option
- 3 **Speed Lease**...90- or 180-day terms, with buy-out or conversion to other leases
- 4 **20/20 Lease**...10% security deposit, 20 equal payments, 10% buy-out
- 5 **90-day Deferred Lease**...no payment for 90 days; first and last payment in advance

*All leases are subject to credit approval. All lease payments in our ads are based on the "True Lease" program at 48 months. Prices, lease prices, and rates are subject to change without notice.

NOTE: Minimum lease payment is \$50 per month.

Toll-free information: 1-800-364-LESS

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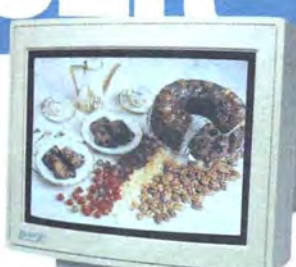
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A **radius**



B **SUPERMAC**



C **RASTEROPS**
THE ART & SCIENCE OF COLOR™



D **Real Tech**



E **MITSUBISHI**



F **NEC**



G **SONY**



H **Real Tech**



I **SII**
Seiko Instruments



K **NEC**



M **SIGMA DESIGNS**

Don't know which card is compatible with your CPU & monitor? Call us toll-free.

	Price	Maximum resolution	Accelerated
RASTEROPS			
ProColor 32	\$3,099	1152 x 870	■
PaintBoard 24	1,559	1152 x 870	■
8XL	469	1152 x 870	■
PaintBoard Li (24)	829	1024 x 768	■
24STV*	779	640 x 480	■
MediaTime*	1,549	640 x 480	■
SUPERMAC			
Spectrum/24 PDQ Plus	\$1,549	1152 x 870	■
Spectrum/8 NuBus	419	1024 x 768	■
Spectrum/8 LC II, IIsi	499	1152 x 870	■
Spectrum/24 Series IV	829	1024 x 768	■
Spectrum/8•24 PDQ	829	640 x 480	■
Spectrum/8•24	579	640 x 480	■
Thunder 24	2159	1152 x 870	■
ThunderLight	1669	1152 x 870	■
Video Spigot*	369	160 x 120	■
Video Spigot & Sound*	479	160 x 120	■
RADIUS			
Precision Color 24X	\$1,649	1152 x 882	■
Precision Color 8XJ	499	1152 x 882	■
Precision Color 24XK	829	1024 x 768	■
Precision Color 24XP	499	832 x 624	■
Video Vision*	1,979	640 x 480	■
E-MACHINES			
ColorLink DC/T (8-bit with Ethernet)	519	1024 x 768	■
ColorLink SX/2 (24-bit with Ethernet)	649	1024 x 768	■
Futura SX24	499	1024 x 768	■
DoubleColor LX (8)	699	1152 x 870	■

*24-bit; captures up to 30 frames per second



J **RASTEROPS**
THE ART & SCIENCE OF COLOR™



N **Real Tech**



L **radius**



P **SONY**

monitors!

Hours: 8 am-7 pm Central Standard Time

30-DAY MONEY-BACK GUARANTEE on all hardware (except leases, printer consumables and special-order items). Sorry, no returns on PowerBooks. Before returning merchandise, call our Customer Service Dept. toll-free to receive a returned merchandise authorization number (RMA), which must be included with any returns. No C.O.D. returns. Thank you for your cooperation. ALL PRICES ARE SUBJECT TO CHANGE WITHOUT NOTICE. Hardware That Fits is located at 610 S. Frazier in Conroe, TX 77301.

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Have your customer number ready
Call 1-800-364-MACS.

HARDWARE THAT FITS *Color printers*



The photo above is a 300 dpi image of an 8 x 10 transparency. It was scanned on the RealTech Scan 800 with Transparency Option, then adjusted with ScanMatch and color-corrected with Adobe Photoshop.



MICROTEK
Scanmaker IIIE

\$1,179

Lease: \$33/mo.



Scan 800 with Transparency Option



\$1,099

Lease: \$30/mo.

Scanners

Flatbed desktop scanners for 24-bit color, 8-bit grayscale, and black/white images. Ideal for mid-range output or position prints for mockups/presentations.

	Price	DPI	Brightness & contrast levels	Scanning area	Flat art	Transparencies	Slides	Software
MICROTEK								
Scanmaker II	\$909	600	14	8.5 x 13.5	■			Includes limited version of Adobe Photoshop
Scanmaker IIIE	1,179	600	14	8.5 x 13.5	■			Includes full version of Adobe Photoshop
REALTECH								
Scan 800	\$1,099	800	200	8.5 x 11.75	■			Includes ScanMatch color calibration software
Optional Adobe Photoshop	200							
Scan 800 with Transparency Option	1,595	800	200	8.5 x 11.75	■	■	■	
UMAX								
UC 630	\$1,119	600	51	8.5 x 14	■			Includes full version of Adobe Photoshop
Transparency Option	729	(600)	(51)	6 x 9	■	■	■	
UC 840	1,329	800	51	8.5 x 14	■			Includes full version of Adobe Photoshop
Transparency Option	729	(800)	(51)	6 x 9	■	■	■	

SPECIAL SAVINGS

~~\$8,099~~
WAS

NOW \$6,995

Lease: \$192/mo.

RASTEROPS™
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RasterOps CorrectPrint 300i Dye Sublimation Printer w/36 MB



Uses a 4-color (CMYK) dye sublimation thermal process at 300 dpi for photographic-quality output. Prints on special sheeted paper or transparencies, not on rolls. 8.1" x 11" image size on legal paper. Uses a RISC controller. 35 resident fonts, three interfaces, including TCP/IP.

SII **\$2,699**
Lease: \$73/mo.

Seiko Instruments Personal ColorPoint PSE



Prints full-bleed comps on plain laser paper (up to 10.1x14.33) or transparency film. 300 dpi color thermal printer uses 16 MHz RISC processor. 5 MB RAM standard, upgradable to 9 or 21 MB. Adobe PostScript® compatible. Includes AppleTalk, parallel, and RS-232 interfaces, plus an optional SCSI port. Continuously polls all interfaces; reconfigures automatically. 17 resident fonts.



\$5,995
Lease: \$164/mo.

RealTech Color 350

Prints 11x17 (OB size)* 300 dpi edge-to-edge comps for about \$1.13 per page. (Letter-size output, approx. 69¢ each.) Creates true black text—uses 4 colored ink sheets (CMYK). 25 MHz RISC processor. 10 MB of RAM, upgradable to 18 or 34 MB. Three standard interfaces. 39 resident fonts. Adobe PostScript® compatible; PANTONE® approved** color matching.

*with additional memory

**PANTONE is Pantone, Inc.'s check-standard trademark for color.

QMS 210.....**\$4699**
Seiko Instruments Personal ColorPoint PSX...**\$5999**

Color imaging solutions.

Printing solutions.

Laser printers.

The right printer can do wonders for your productivity. Do you need speed? Adobe PostScript Level 2? Do you need to print a lot of pages each month?

Dpi
Engine speed
RAM

Interpreter
Microprocessor

Duty cycle
Paper trays

SCSI port
Interfaces

Resident fonts
Misc.

LETTER-SIZE PRINTERS

DEClaser 1152

\$995 **digital**

Lease: \$28/month

- 300 dpi
- 4 pages/min.
- 2 Mb RAM (expandable to 4 MB)

- Adobe PostScript Level 2
- Motorola 68000 processor

- 6,000 pages per month
- Adjustable 70 sheet paper tray (optional 250 sheet paper tray)

- No SCSI port
- Appletalk RS-422, parallel, and RS-232C.

- 17 (upgradable to 43 with a cartridge)

Texas Instruments MicroLaser Plus

\$1,099

Lease: \$30/month

- 300 dpi
- 9 pages/min.
- 1.5 Mb RAM (expandable to 4.5 MB)

- Adobe PostScript Level 1
- Motorola 68000 processor

- 10,000 pages per month
- Optional 2nd paper drawer and envelope feeder

- Optional SCSI port
- Appletalk RS-422, parallel, and RS-232C

- 17 Available with 35 resident fonts (\$1239)

NEC Silentwriter Model 95

\$1,469

Lease: \$40/month

- 300 dpi
- 6 pages/min.
- 2 Mb RAM (expandable to 5 MB)

- Adobe PostScript Level 2
- Motorola 68000 processor

- 6,000 pages per month
- Built-in envelope feeder & 250-sheet tray; optional 2nd tray available in letter or legal sizes

- No SCSI port
- Appletalk RS-422, parallel, and RS-232C

- 35 Micro-fine toner and NEC's patented "Sharp Edge" technology create sharp black print quality

NewGen PS 880p

\$2,119

Lease: \$58/month

- 800 dpi
- 4 pages/min.
- 12 Mb RAM (expandable to 32 MB)

- PostScript
- Weitek RISC processor

- 8,000 pages per month
- Built-in 70 sheet paper tray

- Optional SCSI port
- Appletalk RS-422, parallel, and RS-232C

- 35 Supports Adobe PostScript NewGen's proprietary Image Enhancement Technology

Texas Instruments MicroLaser XL Turbo

\$2,795

Lease: \$77/month

- 300 dpi
- 16 pages/min.
- 2.5 MB RAM (expandable to 10.5 MB)

- Adobe PostScript Level 2
- Weitek RISC processor

- 25,000 pages per month
- Optional 2nd paper drawer

- Optional SCSI port
- Appletalk RS-422, parallel, and RS-232C

- 35

TABLOID PRINTERS

NewGen PS 660B

\$4,059

Lease: \$111/month

- 600 dpi
- 8 ppm (letter size); 4.6 ppm (tabloid size)
- 12 Mb RAM (expandable to 96 MB)

- PostScript compatible
- Weitek XL-8220 RISC processor

- 10,000 pages per month
- Optional 2nd paper drawer

- SCSI port
- Appletalk RS-422, parallel, RS-232C

- 35 NewGen's proprietary Image Enhancement Technology

QMS 860 Hammerhead

\$4,279

Lease: \$118/month

- 600 dpi
- 8 ppm (letter size); 4.6 ppm (tabloid size)
- 12 MB RAM (expandable to 32 MB)

- Adobe PostScript compatible
- Intel 80960CA RISC processor

- 10,000 pages per month
- Optional 2nd paper cassette

- SCSI port
- Optional Ethernet
- Appletalk RS-422, parallel, and RS-232C

- 39



TI MicroLaser Plus

TEXAS INSTRUMENTS



MicroLaser XL Turbo

NEC



NEC Silentwriter Model 95



QMS 860 Hammerhead

And more printers...

If you want a printer not listed in this ad, please call us toll-free.

PORTABLE

Kodak Diconix 180si **\$299**
Kodak Diconix 701 Inkjet **449**

LETTER SIZE

NEC Silentwriter 95fx **\$1729**
NEC Silentwriter 97 ... **1769**
NEC Silentwriter 97fx **2059**
NewGen PS/660 **2699**
TI Turbo **1449**

TABLOID SIZE

NewGen 660B w/ Ethernet **\$4499**

COLOR

Seiko ColorPoint PSX **\$5599**

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SAVINGS**

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on DayStar.**

Power up with ACCELERATORS

DAYSTAR DIGITAL

DAYSTAR
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NEW! Turbo 040

Get the maximum in 68040 acceleration and 100% compatibility. For Mac IIci and IIx; includes math chip.

25 MHz Turbo 040.....	\$1099
33 MHz Turbo 040.....	1349
25 MHz FastCache Turbo 040.....	259
33 MHz FastCache Turbo 040.....	339

Universal PowerCache

Math chip available. Supports 16 platforms.

33 MHz Accelerator.....	\$379
40 MHz Accelerator.....	549
50 MHz Accelerator.....	719
PowerCache Adapter.....	40

Photoshop Accelerator

Includes PicturePress 2.5, Charger Plug-ins, and Kodak Photo CD access with clip art images.

Charger.....	\$799
--------------	--------------

RADIUS

radius ROCKET™

For the Mac II family. Includes QuickDraw and display-list acceleration software.

Radius Rocket 25i.....	\$999
Radius Rocket 33.....	2069
SCSI II Booster.....	249
Rocket Share.....	419

NEWER TECHNOLOGIES

Newer™
TECHNOLOGY

Variable Speed Overdrives

A cost-efficient way to speed up your Quadra 700, 900, 950, or IIx. Installs in the ROM socket, leaving the NuBus and PDS slots free for other upgrades.

Q700/900 Overdrive.....	\$269
Accelerates from 25MHz-33MHz	
Q950 Overdrive.....	269
Accelerates from 33MHz-42MHz	
IIx Overdrive.....	269
Accelerates from 40MHz-55MHz	

**Do you feel
the need
for speed?**

**Call us toll-free, and
we'll match you with
the right accelerator.**



Applied Engineering™

FUSION
DATA SYSTEMS

PLI HARD DRIVES



PLI MiniArray Drives

Up to 10 MB/second transfer rate. Perfect for digital video.

1 GB MiniArray Drive-Int.....	\$2629
1 GB MiniArray Drive-Ext.....	2869
2 GB MiniArray Drive-Int.....	3849
2 GB MiniArray Drive-Ext.....	4149

MODEMS

Supra v.32 bis 14,400.....**\$299**

SupraFax Modems include STF and Microphone software, and are backed by a 5-year warranty.

SupraFax Modem Plus.....	159
SupraFax 144 PB.....	299
SupraFax 144 PB Plus.....	399

MassMicro FM 24/96 Network.....	359
MassMicro FM 24/96 Personal.....	165

Global Village PowerPort-Gold.....	399
Global Village PowerPort-Silver.....	339
Global Village PowerPort-Bronze.....	189

INTERNATIONAL: 1-409-760-2400

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FAX 24 HRS/DAY: 1-409-539-4141

Networking products

CARDS & HUBS

ASANTÉ



**Asanté
10T Hub/8
(Ethernet
concentrator)**

Lets you use inexpensive unshielded twisted-pair (UTP) telephone wire instead of expensive coaxial cable for local area networks.

10Base-T Hub/8.....**\$255**

Asanté EN/SC (SCSI-to-Ethernet adapter).

For Macs without available slots.

EN/SC.....**\$329**

Asanté MacCon 3 Ethernet card. Automatically configures to media used.

MacCon 3 Card.....**\$209**

DaynaPORT E/II-T NuBus Card

Connects Mac II computers to thick, thin, fiber optic or 10Base-T Ethernet cable systems.

Includes an RJ-45 jack for 10Base-T wiring.

DaynaPORT E/II-T NuBus Card.....**\$149**

DaynaPort E/Z. Ideal for Macs that don't have a slot for a network interface card.

DaynaPORT E/Z.....**\$269**

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CAYMAN
SYSTEMS

Farallon™

Shiva

FastPath SR Router/Gateway.....	\$1669
NetBridge.....	589
EtherGate Router.....	1239
NetSerial.....	269
NetModem/E.....	1409
NetModem v.32 (for LocalTalk).....	989
Hublet.....	199
LanRover/L.....	579
LanRover/E (4-port).....	1659
TeleBridge.....	589

Dayna EtherPrint

Supports AppleTalk Phase 1 and Phase 2 protocols; divide your network into multiple zones.

Dayna EtherPrint.....	\$335
EtherPrint Plus.....	439



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Have your customer number ready.
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Customized solutions.

We can help you solve the equation of price, function, and affordability.



\$2,859
Lease: \$78/month

PowerBook Duo 230 8/80
8 MB of RAM, 80 MB hard drive 33 MHz 68030 microprocessor, FPU.

\$3,465
Lease: \$95/month

Macintosh IIvx Business Solution
Macintosh IIvx, 5 MB of RAM, 245 MB Maxtor hard drive, SuperMac 21" Platinum monitor w/video card, cache card, and Key Tronic MacPro Plus extended keyboard.

\$6,979
Lease: \$191/month

Quadra 800/Trinitron Intermediate Graphics Solution Quadra 800; 8 MB of RAM, 230 MB hard drive, RealTech 20" Trinitron monitor w/RasterOps PaintBoard Li and Key Tronic MacPro Plus extended keyboard.

\$9,445
Lease: \$259/month

Quadra 950/Trinitron High-end Graphics Solution
Quadra 950, 8 MB of RAM, 520 MB Micropolis hard drive, RasterOps 20" Trinitron monitor w/RasterOps PaintBoard Li and Key Tronic MacPro Plus extended keyboard.

Your choice of
CPU & HARD DRIVE
+
your choice of
MONITOR
+
your choice of
PERIPHERALS
+
OUR GREAT VALUES
+
OUR GREAT SERVICE
=
100% SATISFACTION

Talk to one of our friendly systems consultants. They'll help you figure out the right solution for your business. We can configure any combination of CPU and hard drive with the monitor and peripherals of your choice (even if you don't see it in this ad). That's why we've come to be known as your

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FOR CUSTOM
SOLUTIONS**

POWERBOOK SYSTEMS

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PowerBook Duo 230 8/80	2859
PowerBook 160 8/40	2679
PowerBook 165c 4/80	3399
PowerBook 180 8/80	4359

POWERBOOK PORTABLE DOCKS

PowerLink Presentor (8-bit)	\$469
Designed for presentations. Connects the PB Duo to almost any type of video screen. The ideal travel dock.	
PowerLink DeskNet (8-bit)	659
Connects to Ethernet networks, color displays, external SCSI devices, etc.	



LCIII SYSTEM

LCIII, 4 MB of RAM, 80 MB hard drive, RealTech 15" full page display, and standard Apple keyboard **\$1799**

CENTRIS 610 SYSTEMS

Centris 610, 4 MB of RAM, 80 MB hard drive, Seiko Instruments 14" Color CM1445 monitor, and Key Tronic MacPro Plus extended keyboard	\$2415
Centris 610, 8 MB of RAM, 80 MB hard drive, RealTech 17" color monitor, built-in Ethernet and Key Tronic MacPro Plus extended keyboard	\$3179

CENTRIS 650 SYSTEMS

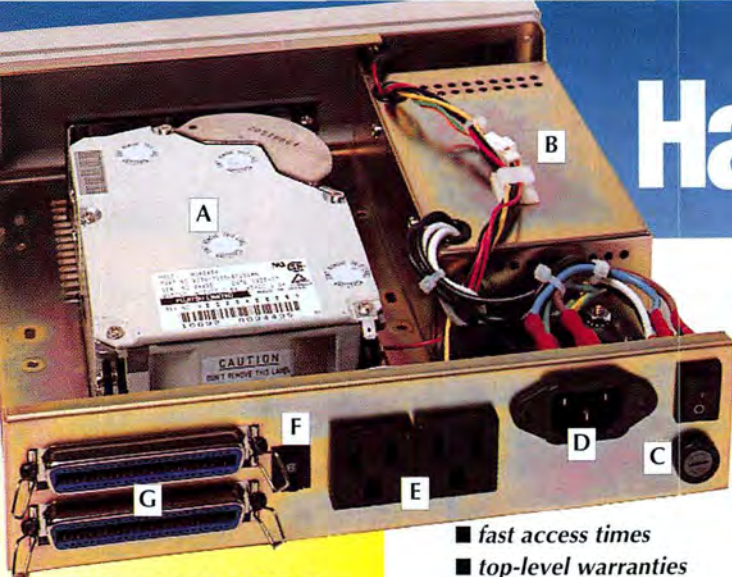
Centris 650, 8 MB of RAM, 80 MB hard drive, Sony 17" Color monitor, and Key Tronic MacPro Plus extended keyboard	\$4075
Centris 650, 8 MB of RAM, 230 MB hard drive, 20" Real Tech Trinitron monitor, RasterOps Paintboard Li, built-in Ethernet and FPU, and Key Tronic MacPro Plus extended keyboard	\$6229

Hours: 8 am-7 pm Central Standard Time

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HARDWARE THAT FITS

Hard drives from



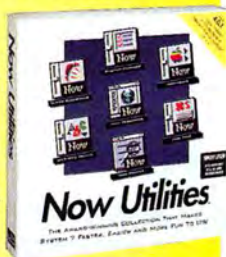
YOU'VE BEEN BUYING FROM US SINCE 1985.

To a lot of you, we've become a trusted business partner. So when you told us we needed to offer you more storage options, we listened. Our systems engineers have worked tirelessly to design the best possible enclosure for name-brand mechanisms. **The result? These drives are the value you've been looking for—priced right, and built with the quality your irreplaceable data demands.**

During the past eight years, we've become America's one-stop source for Macintosh solutions. Now we can be your one-stop source for storage solutions, too. Because we're the company you can trust to give you the very best...

- **QUALITY**
- **SERVICE**
- **VALUE**

Stack up our drives against the "best of the best" and they'll come out on top. You can trust us to always bring you the highest-quality Mac hardware!



Limited time offer!

Included **FREE** with your drive...award-winning **Now Utilities (Version 4.0.1).**

Includes 7 powerful utilities: Startup Manager, Super Boomerang, WYSIWYG Menus, Now Profile, Now Scrapbook, Now Save, Now Menus. Use Now Utilities to maximize System 7's capabilities, and to simplify using your Mac.

Name-brand mechanisms in the highest-quality enclosure available

WHY OUR DRIVES ARE SUPERIOR

- A. We use the highest quality name-brand mechanisms available; fully tested and burned in
- B. Shielded 40 watt power supply (65 watt for FH drives) provides an additional margin of safety from electrical interference, keeping your data free of corruption
- C. External fuse keeps fuse replacement simple
- D. Power cable plug-in

- E. 2 switched outlets provide power to additional peripherals, allowing 1-step system power-up
- F. Easy-to-use pushbutton SCSI I.D. selector switch
- G. Two 50-pin SCSI connectors for simple configuration

Premium double-shielded 26-inch Mac-to-SCSI cable (not shown) prevents electronic interference. Thermally-engineered ventilation maintains optimum airflow, cools internal mechanisms; quiet cooling fan. Universal power supply (90-260 volts).

Need a really big drive, with a LOT of storage capacity? These drives offer big performance.

	Model number	Internal price	External price	Formatted Mac capacity (in MB)	Average access time (in ms)	Transfer rate* (in Mb/second)	Form factor**	Warranty (years)
1.2 - 3.6 GB								
Fujitsu 1.2	M2266	\$1249	\$1349	1079	14.5	3.0 ¹	FH	5
HP 1.2	C2247	1589	1659	1000	10.5	5.3 ¹	HH	5
Micropolis 1.2	M2112	1449	1519	1005	10	5.0 ¹	HH	5
Quantum 1.2	PRO1225	1599	1669	1200	10	2.9 ¹	HH	2
Toshiba 1.2	MK-538FB	1399	1469	1200	12.5	4.0 ¹	HH	3
Maxtor 1.2	MXT-1240	1549	1619	1240	9	4.5 ¹	HH	3
Conner 1.3	CP-31370	2059	2129	1030	10.5	6.0 ¹	HH	1
Micropolis 1.5	M1528	2299	2399	1341	14.5	2.9 ¹	FH	5
Micropolis 1.6	M1548	2379	2479	1748	14	4.8 ¹	FH	5
Fujitsu 2.0	M2652	\$2299	\$2399	1752	11	4.8 ¹	FH	5
Seagate 2.1	ST42100N	1999	2099	1900	12.9	3.9 ²	FH	5
Fujitsu 2.4	M2654	2549	2649	2000	11	4.8 ¹	FH	5
Micropolis 2.4	M1924	2649	2749	2100	11.5	4.5 ²	FH	5
Seagate 2.4	ST42400N	2879	2979	2050	11s	4.5 ²	FH	5
HP 2.4	C3010	2899	2999	2000	11.5	5.3 ¹	FH	5
Seagate 3.4	ST43400N	\$3999	\$4099	2750	11	6.0 ²	FH	5
Micropolis 3.6	M1936	4199	4299	3022	12	6.0 ¹	FH	5

* Transfer rate (or throughput) depends on your Mac CPU and system configuration. For more information, ask your Hardware That Fits sales partner. ** Form Factor Low Profile (LP)=3.5 Half Height (HH)=3.5 Full Height (FH)=5.25

¹ SCSI-2 ² SCSI-2 Fast These drives are most efficient when used with a Macintosh Quadra 800, 950 or a RealTech SCSI-2 card.

REALTECH SCSI-2 CARD

Allows all NuBus Macs to communicate with newer, high-performance hard drives at substantially faster transfer rates.

Sustained transfer rate of up to 4.4 MB per second, plus a burst transfer rate of 6 MB per second (6/10 on a Quadra). Mirroring capabilities.\$299



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HARDWARE THAT FITS



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Maxtor®

Quantum

FUJITSU

Seagate

TOSHIBA

MICROPOLIS

CONNER

MAXOPTIX

REALTECH MAGNETO-OPTICAL

128 MB Epson Drive w/1 disk
(29 ms access time;
1 yr. warranty).....**\$1069**
Drive w/Diskette 5-pack.....**1229**

Maxoptix Tahiti II Drive
(652/1.0 GB capacity; 35 ms
access time; 1 yr. warranty).....**\$3269**

REALTECH TAPE BACKUP

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of a floptical? Call
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your options.

	Model number	Internal price	External price	Formatted Mac capacity (in MB)	Average access time (in ms)	Transfer rate* (in Mb/second)	Form factor**	Warranty (years)
80 - 120 MB								
Conner 85	CP-30080E	\$209	\$279	82	17	1.5	LP	1
Quantum 85	ELS85	205	275	82	17	1.4	LP	2
Conner 120	CP-30100	259	329	116	17	1.5	LP	1
Maxtor 120	7120XT	229	299	121	15	1.5	LP	2
120 - 250 MB								
Quantum 127	ELS127	\$259	\$329	124	17	1.4	LP	2
Conner 170	CP-30170E	289	359	160	9	1.5	LP	1
Quantum 170	ELS170	279	349	160	17	1.4	LP	2
Conner 212	CP-30200	369	439	206	12	2.5 ¹	LP	1
Maxtor 213	7213	329	399	207	15	2.8	LP	2
Quantum 240	LPS240	369	439	234	10	1.4	LP	2
Maxtor 245	7245	359	429	245.6	15	3.0	LP	2
320 - 570 MB								
Maxtor 340	LXT-340	\$599	\$669	324	15	2.1 ¹	HH	2
Fujitsu 520	M2624FA	899	969	496	9	2.7 ¹	HH	5
Quantum 525	LPS525	929	999	500	10	3.2 ¹	LP	2
Maxtor 540	MXT-540	969	1039	546	9	5.5 ¹	HH	2
Conner 540	CP-3540	899	969	515	12	5.5 ²	HH	1
Micropolis 560	M2105	1069	1139	560	10	5.0 ²	HH	5
700 MB - 1.3 GB								
Quantum 700	PRO700	\$1249	\$1319	700	10	2.9 ¹	HH	2
Micropolis 800	M2108	1349	1419	698	10	5.0 ¹	HH	5
Toshiba 877	MK-438FB	1099	1169	830	12.5	3.0 ¹	HH	2
Quantum 1050	PRO1050	1419	1489	1000	10	2.9 ¹	HH	2
HP 1050	97558	1649	1749	987	13.5	2.8 ¹	FH	5

* Transfer rate (or throughput) depends on your Mac CPU and system configuration. For more information, ask your Hardware That Fits sales partner. Low Profile (LP)=3.5 Half Height (HH)=3.5 Full Height (FH)=5.25

¹ SCSI-2 ² SCSI-2 Fast These drives are most efficient when used with a Macintosh Quadra 800, 950 or a RealTech SCSI-2 card.

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► **128REM Sony**

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► **256REM MOST**

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MacUser Labs, April 1993

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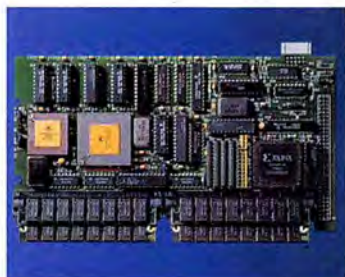
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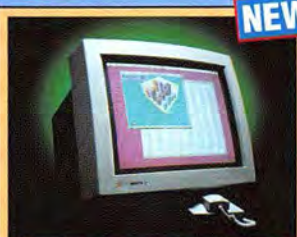


Sweet 16 System

The RasterOps Sweet 16 system is a color monitor bundled with the 24MX video card. The 16" monitor has a resolution of 624 x 832 pixels. The 24MX is a 24-bit NuBus video card. It has a built-in QuickDraw accelerator and 2 MB of VRAM on-board, upgradable to 16 MB of off-screen memory. Three-year warranty.

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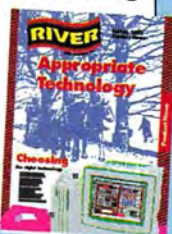
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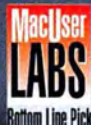
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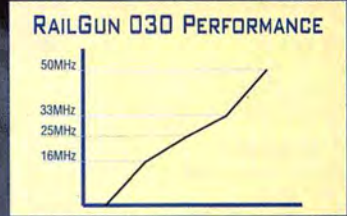
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☐ 01) 1-4 ☐ 02) 5-49 ☐ 03) 50+

2. Your primary job function is: (check one)

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☐ 07) Systems, Programming ☐ 08) Computer Dealer/VAR

3. For which of the following products are you involved in selecting brands/models to be bought by your company or organization? (check all that apply)

4. Which of the following products have you bought in the last 6 months? (check all that apply)

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☐ 16 ☐ 16
☐ 17 ☐ 17

5. If so, what function do you serve in the buying process? (check all that apply)

☐ 01) Initiation/Determine Need
☐ 02) Selection of Brand and Model
☐ 03) Selection of Source
☐ 04) Authorization
☐ 05) Other

6. Over the next 12 months, how much will your organization spend on computer products or services? (check one)

☐ 01) over \$5 million ☐ 05) \$50,000 - \$99,999
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1. For how many micro computers do you buy products? (check one)

☐ 01) 1-4 ☐ 02) 5-49 ☐ 03) 50+

2. Your primary job function is: (check one)

☐ 01) Administrative/ ☐ 03) Engineering/R&D
☐ 02) MIS/DP, Communications ☐ 04) Finance/Accounting
☐ 05) Marketing/Sales Systems, Programming ☐ 06) Computer Dealer/VAR

3. For which of the following products are you involved in selecting brands/models to be bought by your company or organization? (check all that apply)

4. Which of the following products have you bought in the last 6 months? (check all that apply)

SOFTWARE
Accounting ☐ 01 ☐ 01
Spreadsheets ☐ 02 ☐ 02
Project Managers ☐ 03 ☐ 03
Word Processors ☐ 04 ☐ 04
Database Managers ☐ 05 ☐ 05
Graphics ☐ 06 ☐ 06
Integrated Software ☐ 07 ☐ 07
Communications ☐ 08 ☐ 08
Utilities ☐ 09 ☐ 09

HARDWARE

Modems ☐ 10 ☐ 10
Scanners ☐ 11 ☐ 11
Microcomputer ☐ 12 ☐ 12
Printers/Plotters ☐ 13 ☐ 13
Monitors/Displays ☐ 14 ☐ 14
Storage ☐ 15 ☐ 15
Add-in Boards ☐ 16 ☐ 16
Networking ☐ 17 ☐ 17

5. If so, what function do you serve in the buying process? (check all that apply)

☐ 01) Initiation/Determine Need
☐ 02) Selection of Brand and Model
☐ 03) Selection of Source
☐ 04) Authorization
☐ 05) Other

6. Over the next 12 months, how much will your organization spend on computer products or services? (check one)

☐ 01) over \$5 million ☐ 05) \$50,000 - \$99,999
☐ 02) \$1 - 5 million ☐ 06) \$10,000 - \$49,999
☐ 03) \$500,000 - \$999,999 ☐ 07) under \$10,000
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Networking
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Power Supplies
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PREMIER

303
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CLASSIFIED

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BUSINESSCARD

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BUSINESS CARD

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331

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Category continues on page 321.

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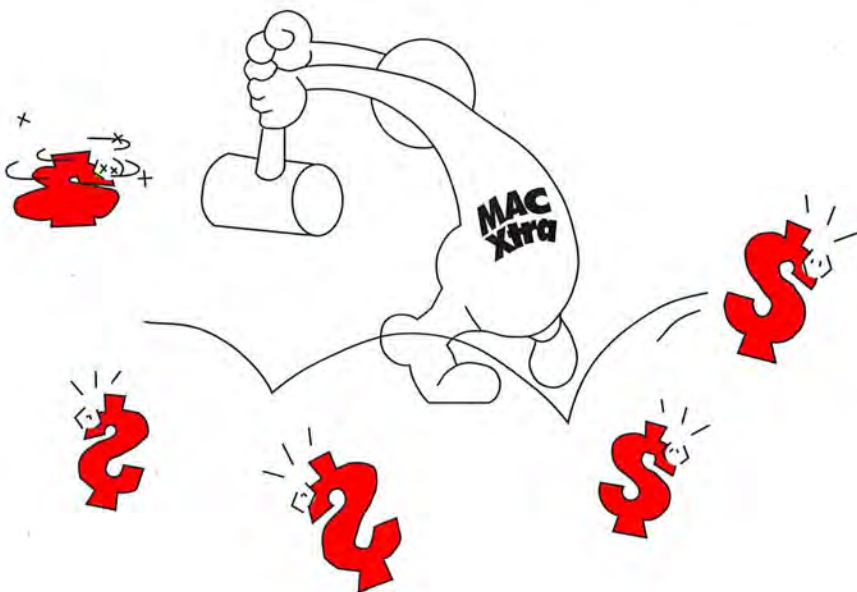
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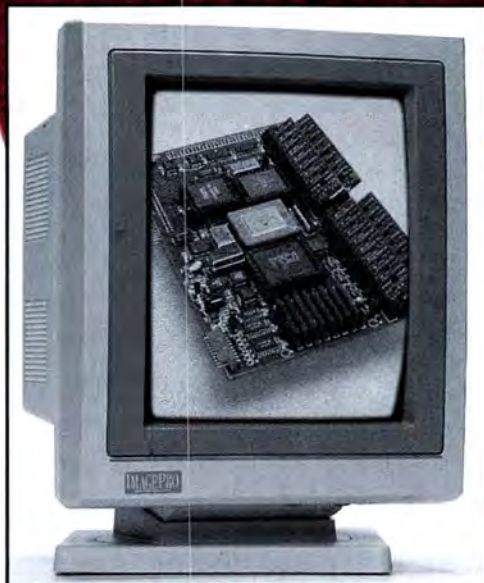
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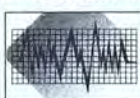
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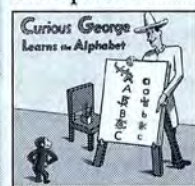
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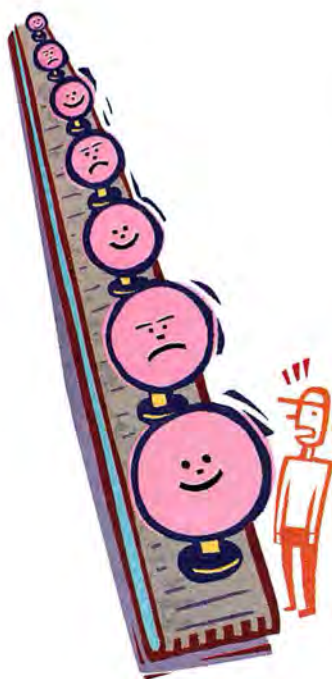
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Alter Egos



When will Apple ship its last Mac? It takes two Dvoraks to make the prediction.



This month I'm going to do what I do best: argue. But I'll take both sides of the debate this time, so I can experience on one page both the thrill of victory and the agony of defeat. Unusual.

Bad Dvorak: A well-known newsletter writer had a contest asking his subscribers to guess when they thought the last mainframe would be unplugged. Most people suggested the year 2000. I thought the idea was just a cute gimmick until I realized that the same contest could be held with the question rephrased to ask: When will the last Mac roll off the assembly line? From the looks of it, the time is coming soon. If Apple can't successfully make the transition to the PowerPC and if it can't make any money from the dubious Newton devices, then the company will be no more.

Good Dvorak: This is alarmist nonsense. Apple *can* make the transition to the PowerPC, and the Newton will do just fine. Even if it doesn't, so what? Apple has been continually growing since its inception, and I see no reason for things to change. Look at the slew of new machines that Apple's announced lately.

Bad Dvorak: Yeah, but Apple's always had lots of great new products. Look at the company now: It's got *nothing* new. Sure, Apple's churned out a completely new lineup of machines, but the differences among them are hardly worth mentioning. Maybe the industry is going into a new phase, not unlike the automobile industry. Functionally, there is little difference between a Ford and a Mercury. Both are made by the same company. Both use the same components. The only real difference is in the design, and even that doesn't differ radically from one machine to the next. To the outside observer, it looks like Apple's just stirring the product pot because it's at a dead end and doesn't want anyone to notice.

More disconcerting is that so many Mac users have moved to Windows and the PC. These are die-hard Mac users who essentially are giving up on the Mac. Of course, all the cheapskates who'll buy whatever is cheapest have long since moved to Windows. Apple used to tout price-comparison studies that showed how the Mac was, in fact, less expensive than a PC if you crunched the numbers just right (and ignored the \$999 486SX machines). Now that IBM, Compaq, and other onetime premium-price producers have

turned to lowball pricing, Apple can't make those numbers add up anymore.

Good Dvorak: Nobody bought into that crap, anyway. People know they're buying convenience and alternative computing ideas when they buy a Mac. Mac owners pay a premium. It still turns out to be cheap. Have you ever tried hooking a SCSI device to a PC? If your time is worth anything, you'll want a Mac.

Bad Dvorak: Then why are all the users bailing out? I can think of four former editors-in-chief of *MacUser* who now have Windows machines on their desks. And at least two of them are actually *using* Windows! The cohost on your radio show used to be a Mac fanatic — you mentioned this last month — now he's a Windows user. And, finally, recent studies show that the majority of Macs being sold today are replacements for older Macs.

Good Dvorak: I have no idea why these guys are going to Windows. They're nuts. As for your replacement-market theory — so what? Replacing old cars with new cars hasn't ruined the auto industry. Don't all consumer markets eventually become replacement markets?

Bad Dvorak: Well, as far as I'm concerned, the computer market is too young to degenerate into a replacement market already. Where are the new breakthroughs? Is there nothing really cool coming out? It doesn't look like it.

Good Dvorak: Newton.

Bad Dvorak: Same to you, pal!

Good Dvorak: No, I mean the Apple Newton. It's a cool device. Apple will lead the transition to that technology.

Bad Dvorak: Horse-pucky. The Newton is nothing more than a Sharp BOSS with an antenna. These are devices designed for neurotics. Who needs an electronic leash? Maybe the dog, but that's it.


Good Dvorak: I think you're prejudging an untested technology without giving it a chance.

Bad Dvorak: Yes, true. So? Let's get back to the question. When does the last Mac come off the assembly line?

Good Dvorak: I don't know. When?

Bad Dvorak: Middle of 1995. Then guess what will come along?

Good Dvorak: The PowerPC, Pink, and all that.

Bad Dvorak: You'd better hope so. 



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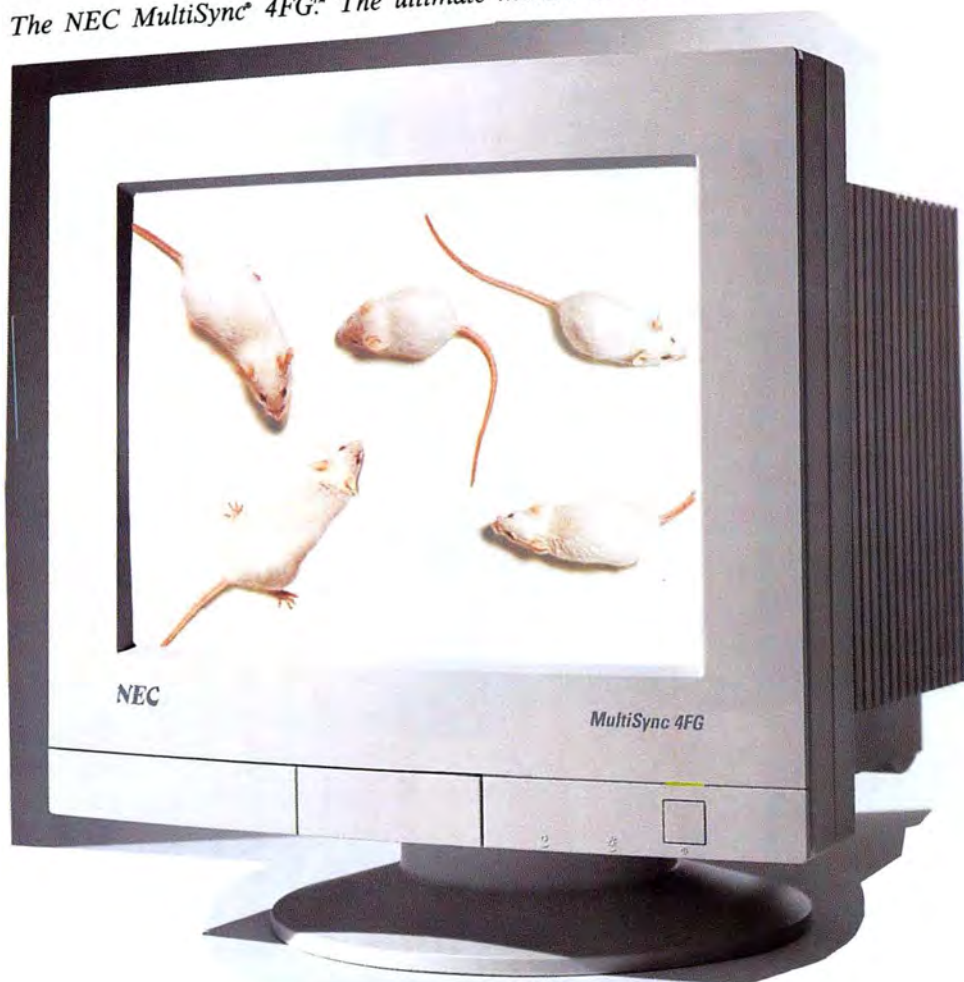
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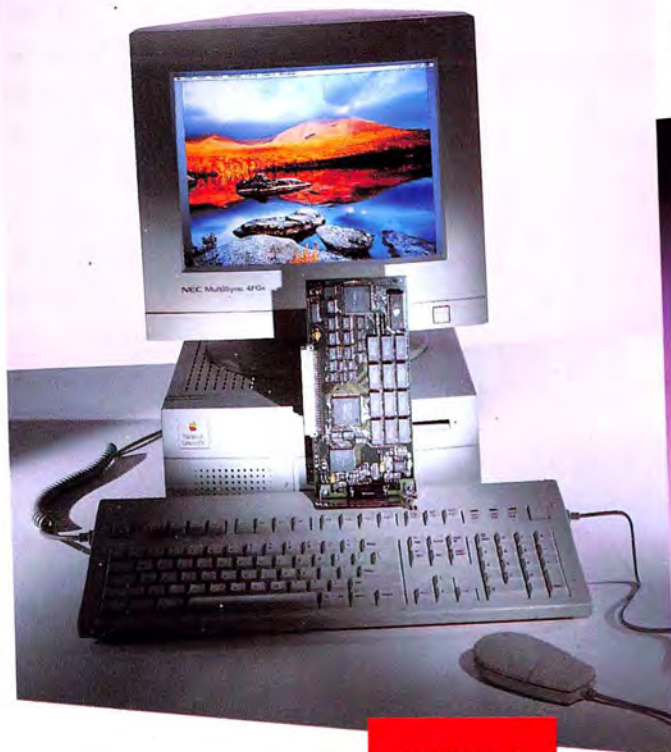
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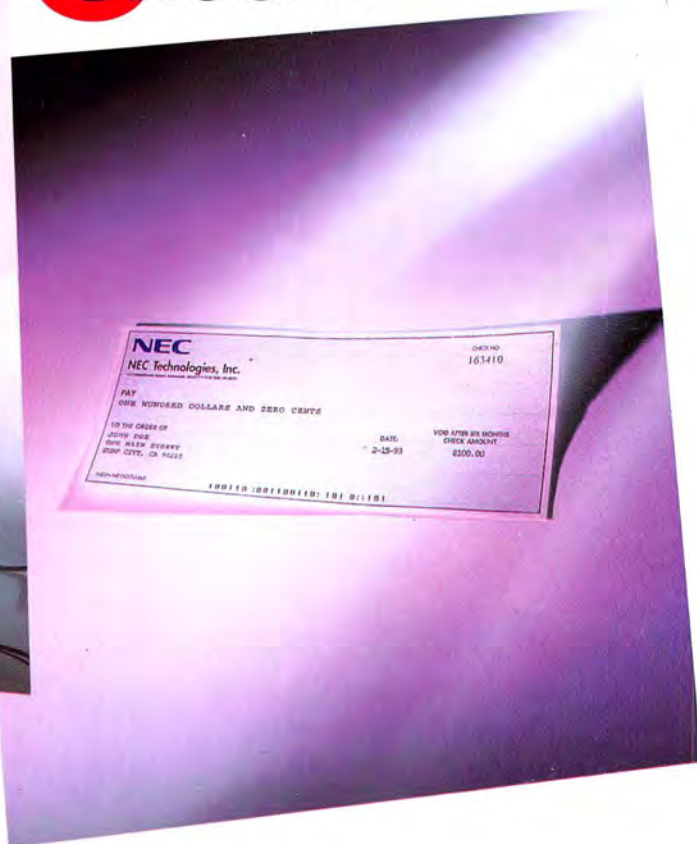
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